HIGHWAYS AGENCY

Safe roads, reliable journeys, informed travellers

Highways Agency
Asset Maintenance and Operational Requirements
Area 4 Specific Requirements

Version 1.15
February 2015

An executive agency of the Department for Transport

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Document Control

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Part 1 – Watchman Operational Requirement	1.7	Feb 2015
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Defined Terms

Defined Term	Definition
Access Date	As defined in the Asset Support Contract Model Contract Data.
Activity	An occurrence, including Planned Events, off the Area Network that has the potential to adversely affect the road users of the Area Network.
Additional Delay	As defined in and generated by the Highways Agency software specified by the Service Manager.
Area Contingency Plan	Details how the Provider will escalate an Incident response from operational (Bronze) to tactical (Silver) and strategic (Gold) command on occasions when needed. It refers to Incidents affecting the Area Network, whether occurring on or off it.
Area Network	As per Asset Support Contract Condition of Contract defined term.
Asset Maintenance and Operational Requirements	As per Asset Support Contract Condition of Contract defined term.
Category 1	For Road Markings & Studs as per Design Manual for Roads and Bridges TD26. For Road Traffic Signs as per Design Manual for Roads and Bridges TD25.
Closure Record	Any entry onto the SRW system, or any successor system, recording any Occupancy or Activity.
Communications Protocol	A procedure that enables stakeholders to exchange information.
Condition Report	For Lighting: An annual summary of inspections, routine maintenance operations and changes in the network supplied to the Highways Agency following the end of each contract year.
Critical Incident	As defined in Incident Response Operational Requirement - Appendix 3.
Defect	A Defect to the asset is that it: • Causes an unintended hazard, nuisance or danger to the users of the Highway • Represents a deterioration from the normal condition • Prevents an item from acting in the intended manner • Is damaged • Is likely to increase the rate of deterioration of another item
Deliverable	An output delivered by the Provider's Processes that contributes to the achievement of Provider's Outcomes.
Departure	Any variation or waiving of a Requirement contained within the Asset Maintenance and Operational Requirements.

Defined Term	Definition
Designated Sites	Nationally-designated sites comprise: Sites of Special Scientific Interest; Local sites, Nature Reserves; Areas of Outstanding Natural Beauty. Internationally-designated sites cover those with European designations including Special Areas of Conservation and Special Protection Areas; and those with international designations, such as Ramsar sites of wetland importance.
Detailed Local Operating Agreement	A working document that describes the procedures, protocols and communication methods to be used by each Local Highway Authority and the National Traffic Control Centre in exchanging and acting upon operational information.
Distribution Network Operator	The operator of the power supply to lighting within the Area Network.
Drainage Liaison Engineer	A nominated person from the Provider organisation, approved by the Service Manager, who is responsible for all drainage surveys, maintenance and renewals, and is the key point of contact within their organisation for all drainage related matters.
Emergency Diversion Route	An off Area Network diversion route used when an Area Network closure occurs and traffic from the Strategic Road Network is diverted along agreed Local Highway Authority routes.
Emergency Services	As per Asset Support Contract Condition of Contract defined term.
Emergency Traffic Management	As defined in Traffic Signs Manual Chapter 8 – Part 2.
Employer	As per Asset Support Contract Model Contract Data.
Environment Agency Flood Warning System	Provides warnings of river and coastal flooding.
Environmental Management Plan	An Environmental Management Plan is a document (or set of documents), which set out agreed procedures and standards for the implementation of identified environmental management actions. It is developed to address the adverse and beneficial environmental impacts arising from planning and design, construction and maintenance and operation of the Area Network.
Equipment	As per Asset Support Contract Condition of Contract defined term.
Flood Champion	The member of the Provider organisation responsible for integration and coordination of flood risk management within their organisation.
Flood Event	The accumulation or passage of water at the ground surface where it is not normally experienced.
Flood Hotspot	A location at high risk of repeated flooding.
Forward Programme	As per Asset Support Contract Condition of Contract defined term.
General Inspection	As defined by the Design Manual for Roads and Bridges for the relevant asset.
Geotechnical Asset Management Plan	As defined in the Design Manual for Roads and Bridges HD41.

Defined Term	Definition
Heavily Trafficked	As defined in Asset Support Contract Service Information Annex 13: Additional Performance Requirements to Asset Maintenance and Operational Requirements.
Highway	As per Asset Support Contract Condition of Contract defined term - Area Network.
Incident	As per Asset Support Contract Condition of Contract defined term.
Incident Data Standard	As defined in the Performance Management Manual.
Incident Response Plan	An overarching strategic plan setting out the resources, Processes, Procedures and Suppliers used by the Provider to deliver Incident response (as required by Annex 24).
Information Systems	As per Asset Support Contract Condition of Contract defined term.
Injurious Weeds	As defined by the Weed Act 1959, Clause 1.
Invasive Species	As defined by the Wildlife and Countryside Act 1981 (as amended), Part I, Clause 14: Introduction of New Species etc., and Schedule 9.
Lane Closure	The time when it is confirmed that there is an Incident impacting a live lane on the carriageway and this is notified to the Network Control Centre.
Lane Opening	The time when the RCC records that the lane closure is no longer impacted by the Incident and this is notified to the Network Control Centre.
Licensee Works	Works carried out under a street works licence as defined in the New Roads and Street Works Act 1991 and any associated secondary legislation.
Lighting Asset Management and Maintenance Manual	The manual which sets out the policies and guidance for the whole lifecycle relating to road lighting systems on the Strategic Road Network.
Lighting Asset Management Plan	The Provider's document describing what maintenance activities are planned (and when) for the lighting asset for the next 12 months.
Lighting Operational Performance Surveys	Scouting to assess and record lighting condition.
Lightly Trafficked	As defined in Asset Support Contract Service Information Annex 13: Additional Performance Requirements to Asset Maintenance and Operational Requirements.
Local Highway Authority	An authority responsible for local roads under relevant legislation.
Maintenance Requirement	A Requirement relating to maintenance service delivery.
Maintenance Requirements Plan	An overarching strategic plan that sets out the Provider's approach to inspections, assessment, Defect repair resources, Processes and Procedures.
Major Incident	As defined in Incident Response Operational Requirement - Appendix 3.
Mobilisation Period	As per Asset Support Contract Condition of Contract defined term.
Network Information	Network Information is information which is in the document of that name referred to in the Contract Data Part One and which describes the Area Network, the Regional Technology Network and the Traffic Technology Systems and their surroundings and provides information pertaining to them and the Employer's assets.

Defined Term	Definition
Network Occupancy Plan	A plan developed by the Provider that describes the approach and controls under which network occupancy will be managed.
Nonconformity	As per Asset Support Contract Condition of Contract defined term.
Occupancy	All works, all Abnormal Indivisible Load movements, all Incidents or all events that take place on the Area Network.
Operation and Maintenance Manual	For tunnels: the manual, specific to each tunnel, which sets out operation, maintenance and emergency response procedures.
Operational Requirement	A Requirement relating to operational service delivery.
Operational Summer Period	The period commencing 1st May and ending 30th September (inclusive).
Operational Winter Period	As per Asset Support Contract Condition of Contract defined term.
Others	As per Asset Support Contract Condition of Contract defined term.
Performance Metric	A metric that describes the output performance relating to a Provider Outcome, Deliverable, Process or Procedure.
Performance Requirement Level	The level of performance the Provider needs to achieve related to a specific Performance Metric.
Planned Event	A planned off Area Network event that has the potential to have an adverse effect on road users of the Strategic Road Network.
Events Calendar	A calendar containing specified details of all Planned Events.
Principal Inspection	Has the meaning given in the Design Manual for Roads and Bridges.
Priority Drainage Asset	Those assets which, if poorly managed or inadequate, pose a risk to either the safety or journey time reliability of road users, or to adjacent property, or to the water environment (or any combination of these).
Procedure	As per Asset Support Contract Condition of Contract defined term.
Process	As per Asset Support Contract Condition of Contract defined term.
Programmed regional technology works including emergency, urgent, extra urgent and fault category T1 and T2 (restore service and permanent repair work)	As defined in the RTMC/TMMM documents
Provider	As per Asset Support Contract Model Contract Data.
Provider Outcome	An outcome required to be achieved by the Provider in relation to a specific Maintenance or Operational Requirement within the Asset Maintenance and Operational Requirements.
Quality Plan	As per Asset Support Contract Condition of Contract defined term.
Regional Control Centre	The Regional Control Centre provides a regional focus for the management and operation of the Strategic Road Network.
Salt Restocking Plan	This plan describes levels of stock required by the Providers and the future procurement arrangements for this resource.

Defined Term	Definition
Schedule of Road Works	Schedule of Road Works, as part of the Highways Agency Pavement Management System suite, is a fully integrated application for the recording and updating of lane closures on the Strategic Road Network consisting of a database, form based and mapping based user interfaces and reporting facilities.
Scheme	As per Asset Support Contract Condition of Contract defined term.
Scope	The extent of the work encompassed by a Maintenance or Operational Requirement.
Service Information	Contractual document defining the Services that the Provider shall undertake.
Service Manager	As per Asset Support Contract Model Contract Data.
Services	As per Asset Support Contract Condition of Contract defined term.
Severe Weather Plan	The plan describes the different activities undertaken by the Provider as part of the severe weather service including details of procedures, operational arrangements, resources and contact information.
Special Inspection	As defined by the Design Manual for Roads and Bridges for the relevant asset.
Statutory Undertaker	Means an undertaker for the purpose of Part III of the New Roads and Street Works Act 1991 as defined in Section 48(4) of that Act and exercising a relevant statutory function as defined in Section 105(1) of that Act.
Strategic Road Network	The network of Motorways and All Purpose Trunk Roads that are the responsibility of the Highways Agency.
Street Works	As defined in the New Roads and Street Works Act 1991 and any associated secondary legislation.
Structures Maintenance Manual	As per Maintenance Manual given in Part 1 of Volume 3 of the Design Manual for Roads and Bridges.
Supplier	As per Asset Support Contract Condition of Contract defined term.
Tactical Incident Response Plan	The Tactical Incident Response Plan details the level of Provider response, planned actions to make safe and estimated time to carriageway opening. The Tactical Incident Response Plan is recorded on the Provider's command and control system.
Temporary Traffic Management	As defined in Traffic Signs Manual Chapter 8 – Part 2.
Traffic Officers	As per Asset Support Contract Condition of Contract defined term.
Watchman Plan	An overarching strategic plan that sets out the Provider's intelligence led approach to delivering the Provider Processes and Procedures for the Watchman Requirement.
WebDAS	The web-based system for submitting and seeking approval for Departures from these Maintenance and Operational Requirements.

Abbreviations

Abbreviation	
ACPO	Association of Chief Police Officers
ADMM	Asset Data Management Manual
AIL	Abnormal Indivisible Loads
AIRSweb	Accident Incident Reporting System
AMOR	Asset Maintenance and Operational Requirements
APTR	All Purpose Trunk Roads
ASC	Asset Support Contract
AW	Authorised Weight
BIS	Business, Innovation and Skills
CCTV	Closed Circuit Television
CBRN	Chemical, Biological, Radiological or Nuclear
COI	Central Office of Information
C&U	Construction and Use
DLE	Drainage Liaison Engineer
DMRB	Design Manual for Roads and Bridges
DNO	Distribution Network Operator
EDR	Emergency Diversion Route
ENOM	Enhanced Network Occupancy Management
EMP	Environmental Management Plan
EPO	Emergency Planning Officer
ESDAL	Electronic Service Delivery for Abnormal Loads
ETM	Emergency Traffic Management
GAMP	Geotechnical Asset Management Plan
HA	Highways Agency
HADDMS	Highways Agency Drainage Data Management System
HAPEP	Highways Agency Planned Events Process
HAPMS	Highways Agency Pavement Management System
HAZMAT	Hazardous Material
JTR	Journey Time Reliability
LAMMM	Lighting Asset Management and Maintenance Manual

Abbreviation	
LAMP	Lighting Asset Management Plan
LCPO	Lowest Cost Practicable Option
LHA	Local Highway Authority
MCHW	Manual of Contract Documents for Highways Works
MNO	Managing Network Occupancy
MRP	Maintenance Requirement Plan
NCC	Network Control Centre
NGF	National Guidance Framework for Operational Activities
NVA	Non-Value Added
NRSWA	New Roads and Street Works Act 1991
NRTS	National Roads Telecommunications Service
NTIS	National Traffic Information Service
NTOC	National Traffic Operations Centre
O&MM	Operation and Maintenance Manual
PI	Principal Inspection
PR	Public Relations
QMS	Quality Management System
RCC	Regional Control Centre
RDD	Regional Divisional Director
RIU	Regional Intelligence Unit
RRS	Road Restraint System
RTMC	Regional Technology Maintenance Contract
SCADA	Supervisory Control And Data Acquisition
SDT	Service Delivery Team
SO	Special Order
SRN	Strategic Road Network
SRW	Schedule of Road Works
STGO	Special Type General Order
SWP	Severe Weather Plan
TAA	Technical Approval Authority
TCB	Tension Corrugated Beam
TIRP	Tactical Incident Response Plan
TMMM	Technology Management and Maintenance Manual
TOS	Traffic Officer Service
TSM	Traffic Signs Manual
TSRGD	Traffic Signs Regulations and General Directions

Abbreviation	
TTM	Temporary Traffic Management
VA	Value Added
VMS	Variable Message Signage
WebDAS	Web based Departures Approval Systems
WEEE	Waste Electrical and Electronic Equipment
WRF1	Winter Reporting Form

Part 0
General

Version 1.6

Purpose

This document sets out the Employer's requirements in relation to the carrying out of maintenance and operational services on the Area Network (hereinafter referred to as Maintenance and Operational Requirements).

Objectives

The Employer has a number of key objectives:

- Improved road user and road worker safety
- High quality customer service
- Best value and improved efficiency
- Reduced congestion and improved reliability
- Asset capability preserved and maintained
- Sustainable operations

Effective maintenance and operation of the Area Network is essential in achieving these key objectives.

Highway authorities have an obligation to maintain public highways to reasonable standards. The current provisions are incorporated in the Highways Act 1980, Section 41 (duty to maintain) and Section 58 (special defence in actions for damages for non-repair). The importance of Section 58 is that it provides the defence "that the authority had taken such care as in all the circumstances was reasonably required to secure that the part of the highway to which the action relates was not dangerous for traffic".

Also, as part of his general obligations under the contract the Provider must take all such actions and do all such things to ensure that the Area Network is maintained and operated to no lesser standards than is appropriate for a highway of the character of the Area Network.

Framework

These Maintenance and Operational Requirements describe the outcomes that the Provider is required to achieve. It is essential that each requirement is read in conjunction with Part 0.

The Provider is generally free to choose the method by which the outcomes are achieved, but that method must include for compliance with these Maintenance and Operational Requirements.

The primary reason for focusing on outcomes is to allow the Provider to innovate in establishing the method by which the Provider Outcomes are achieved, and so reduce the cost to the Employer, without detriment to road user and road worker safety.

This must be reinforced by the implementation of ongoing continual improvement.

The Provider must measure performance using the Performance Metrics described in each Maintenance and Operational Requirement.

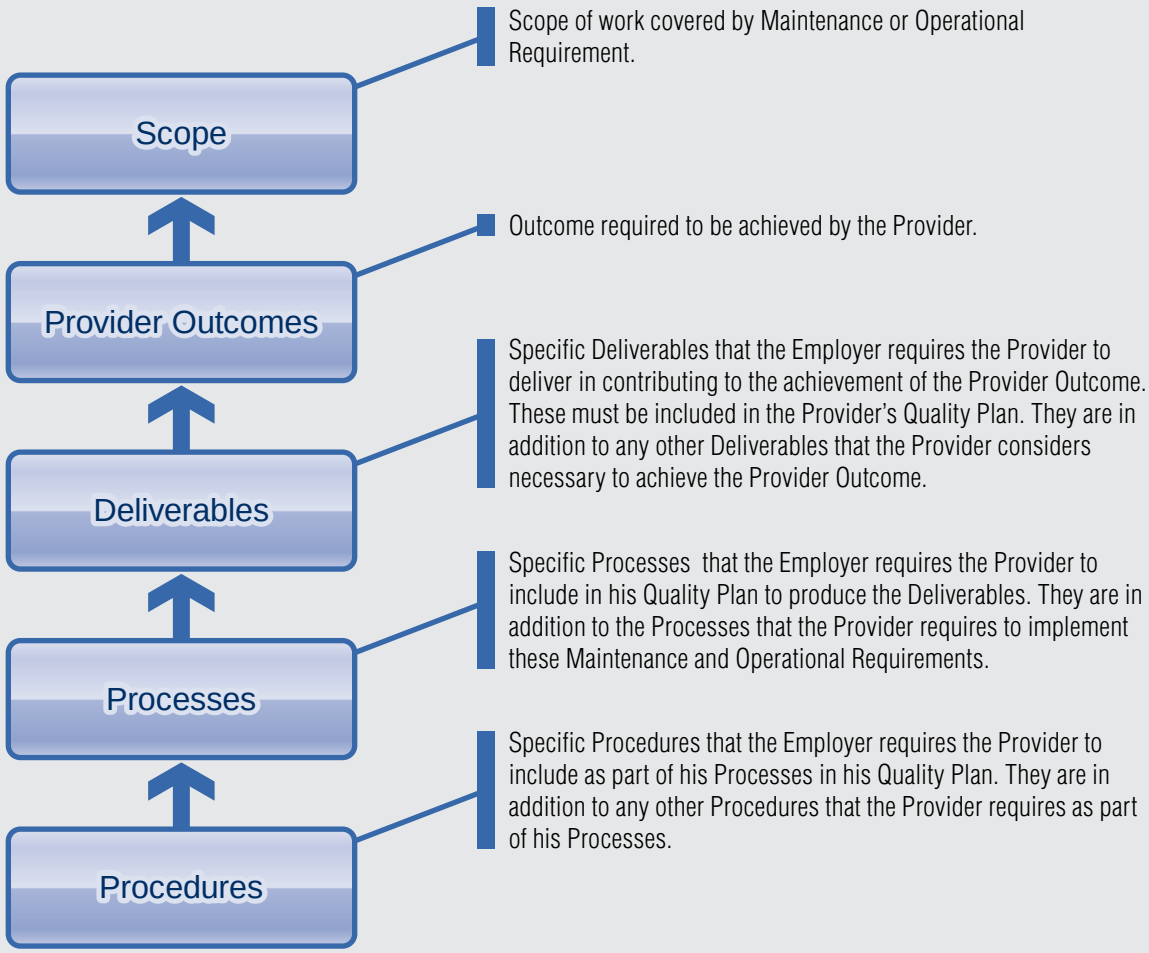
Where Performance Metrics do not have a Performance Requirement Level stated, the Provider must measure and record performance.

Meeting any Performance Requirement Level identified in these Maintenance and Operational Requirements is not determinative of compliance with the Provider Outcomes.

Outcome Based Structure

All the individual Maintenance and Operational Requirements are structured as Figure 0.1:

Figure 0.1 Outcome Based Structure



The Deliverables, Processes and Procedures are not exhaustive. They represent what the Employer specifically requires the Provider to carry out as a minimum. The Provider must in addition establish his own Deliverables, Processes and Procedures necessary to fulfil his obligations under these Maintenance and Operational Requirements, and deliver the Provider Outcomes.

Any failure to deliver a Provider Outcome, Deliverable, Process or Procedure is deemed to be a Nonconformity, and will require root cause analysis and corrective action in accordance with Annex 19 of the Service Information (Reports).

Notwithstanding the preceding paragraph, a failure to deliver a Provider Outcome will not be a Nonconformity if, and only if, the Provider has carried out and complied with the relevant Procedures, Processes and Deliverables (both those included in these Maintenance and Operational Requirements and any additional ones that the Provider deems necessary) and the root cause of the failure is due to circumstances that are wholly outside the control of the Provider and could not reasonably have been foreseen by a provider experienced in highways maintenance and operations.

Within each Maintenance and Operational Requirement there is a schedule of Performance Metrics and the Provider must measure his performance using these metrics all in accordance with Annex 15 of the Service Information (Performance Management).

Risk Based Methodology

The Provider must take a risk based approach to the execution of maintenance and operations in order to provide the best value for money for the Employer whilst demonstrating that risks are being controlled to a tolerable level for all people who use or are affected by the road either as a road user, road worker or Others. For the purposes of AMOR, road user is deemed to include but is not limited to emergency services and road worker is deemed to include but is not limited to traffic officers and Contractors.

In the context of these Maintenance and Operational Requirements a risk based approach means that the Provider prioritises and targets his activities as he deems necessary, using data and information about the Area Network in order to make intelligence led decisions about where and when to undertake maintenance activities to ensure that the Area Network is managed and operated in accordance with the Agency's risk tolerance.

The primary risks that the Provider must identify, assess, evaluate and manage are:

- Risks to safety – these must be controlled so that residual risk exposure for any person is tolerable having regard to the regulatory framework and the Employer's other obligations, policies and objectives. The risks must be controlled to ensure that the Area Network is not dangerous to traffic and provides the Employer with a 'special defence' under Section 58 of the Highways Act 1980. As a minimum, the Provider must provide auditable assurance of such compliance.

- Risks to availability – these must be mitigated to ensure the Provider, so far as may be reasonably practicable having regard to the Employer's other obligations, policies and objectives, secures the expeditious movement of traffic on the Area Network and facilitates the expeditious movement of traffic on road networks for which another authority is the traffic authority.

In identifying, assessing, evaluating and managing these risks the Provider must;

- Determine the scope of the risk assessment
- Identify the hazards
- Identify and consider organisation risk tolerance
- Analyse the risk
- Assess the risk
- Control the risk
- Document the safety risk decision in a safety report
- Handover safety report to operators
- Update and refresh safety report when a change is proposed

This involves the Provider establishing a thorough understanding of the character of the Area Network and the traffic expected to use it.

Based on this understanding, and knowledge of the Area Network condition including risks, Defects and potential Defects, the Provider must prioritise his activities as he deems necessary in order to optimise the use of, and achieve best value from the available resources. The Provider develops clear Processes and Procedures to effectively undertake this prioritisation as part of his Quality Plan.

The Provider must develop Procedures, supported by performance data, that validate his assumptions with regard to his risk based approach. The Procedures must not be limited to the Performance Metrics included in these Maintenance and Operational Requirements. Based on the results of this validation the Provider takes action as necessary to adjust the risk based approach in his Quality Plan.

The safe and effective identification and control of Defects is a key aspect of these Maintenance and Operational Requirements.

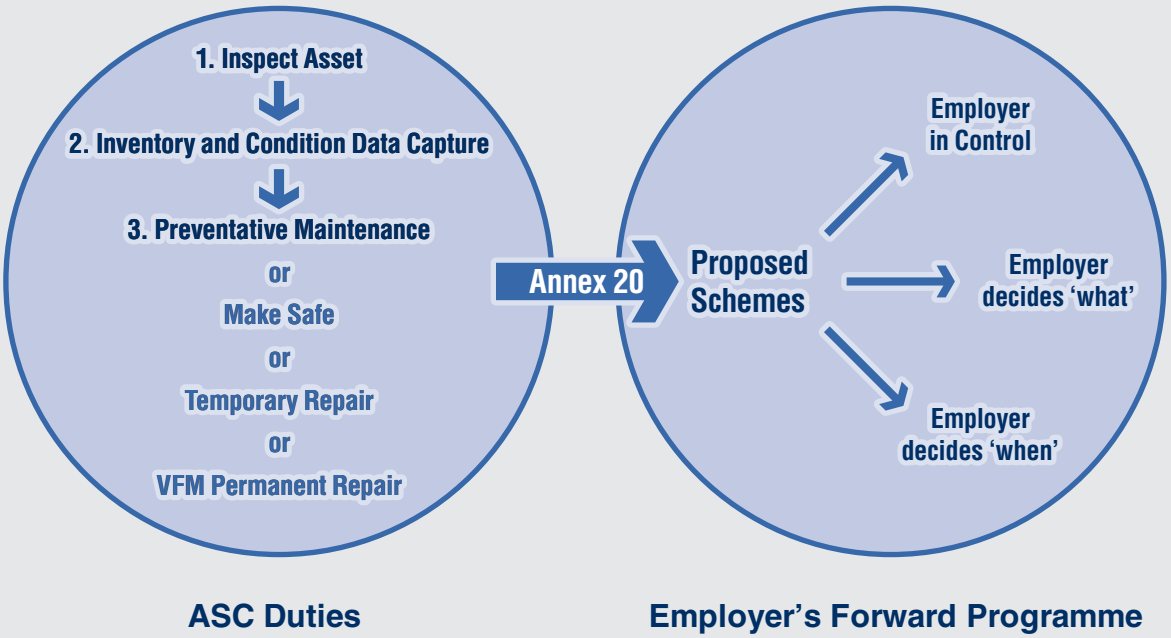
A Defect to the asset is that it:

- Causes an unintended hazard, nuisance or danger to the users of the Highway
- Represents a deterioration from the normal condition
- Prevents an item from acting in the intended manner
- Is damaged
- Is likely to increase the rate of deterioration of another item

The output from these Maintenance and Operational Requirements becomes an input to the Processes for the identification and development of renewal Schemes, as illustrated in Figure 0.2 overleaf.

Reference must be made to Annex 20 of the Service Information (Scheme Development) in relation to Scheme identification.

Figure 0.2 Overview of relationship between Maintenance and Operational Requirements and Scheme identification



The Provider must ensure that the interface with his Scheme identification process is effectively managed and coordinated by ensuring that these Maintenance and Operational Requirements are fulfilled by the Provider prior to proposing Schemes.

Schemes identified by the Provider must be based on the prioritised needs of the Area Network as described in the Employer's Network Delivery and Development Programme Development Management Manual and Value Management Requirements.

The Provider records his performance in accordance with the requirements of Annex 15 of the Service Information (Performance Management) and uses measurement data to continually improve his performance reducing cycle times and cost.

Key Operational Processes for the Provider

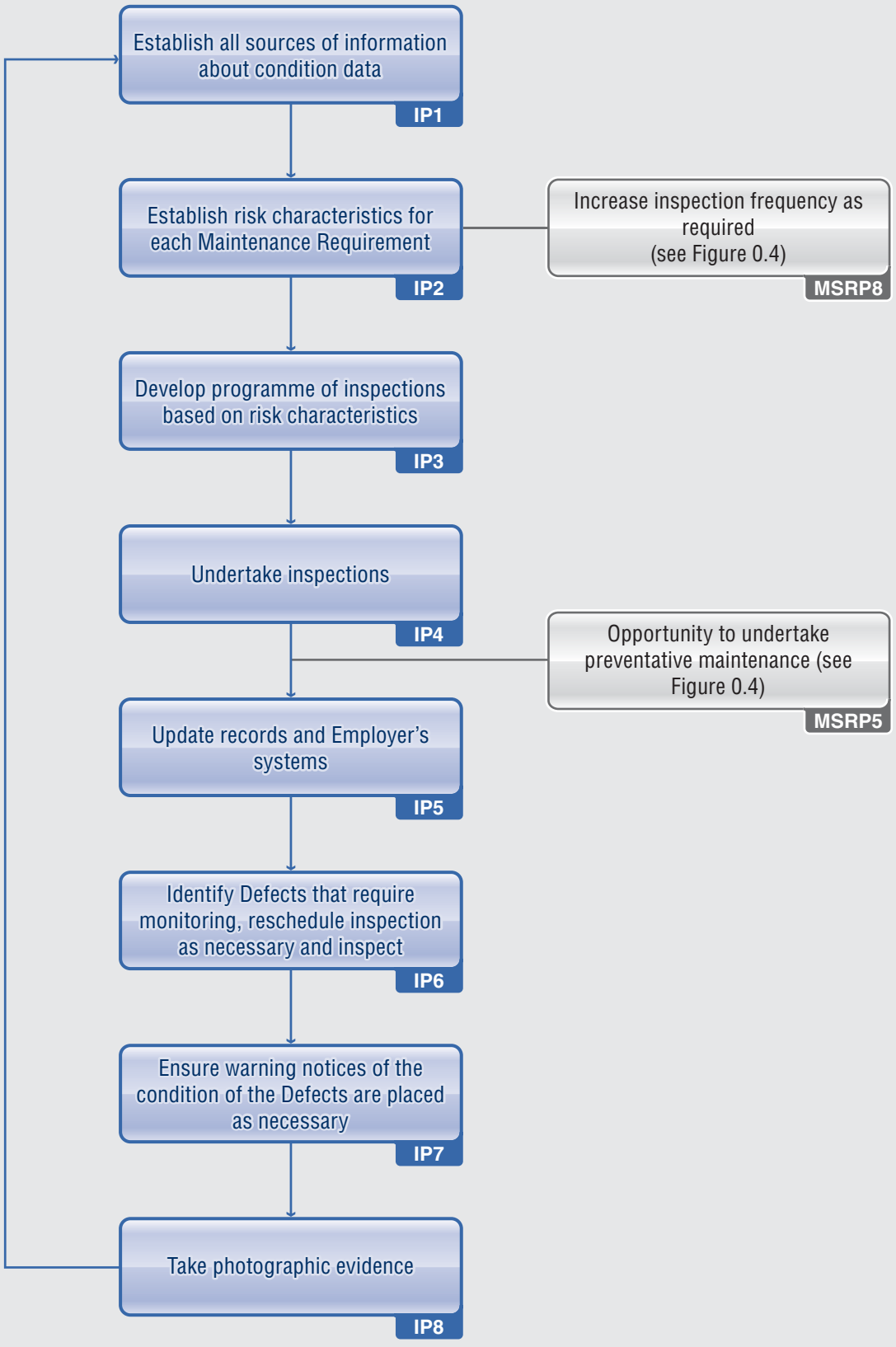
The Provider carries out his activities in a manner that provides the Employer with a 'special defence' under Section 58 of the Highways Act 1980.

The Provider adopts the key Processes shown in Figures 0.3 and 0.4 (with associated activity notes) in relation to risk based inspections and the risk based making safe and repair of the asset.

These are minimum requirements and the Provider must supplement them with any activity he deems necessary to meet his contractual obligations and to deliver the Provider Outcomes.

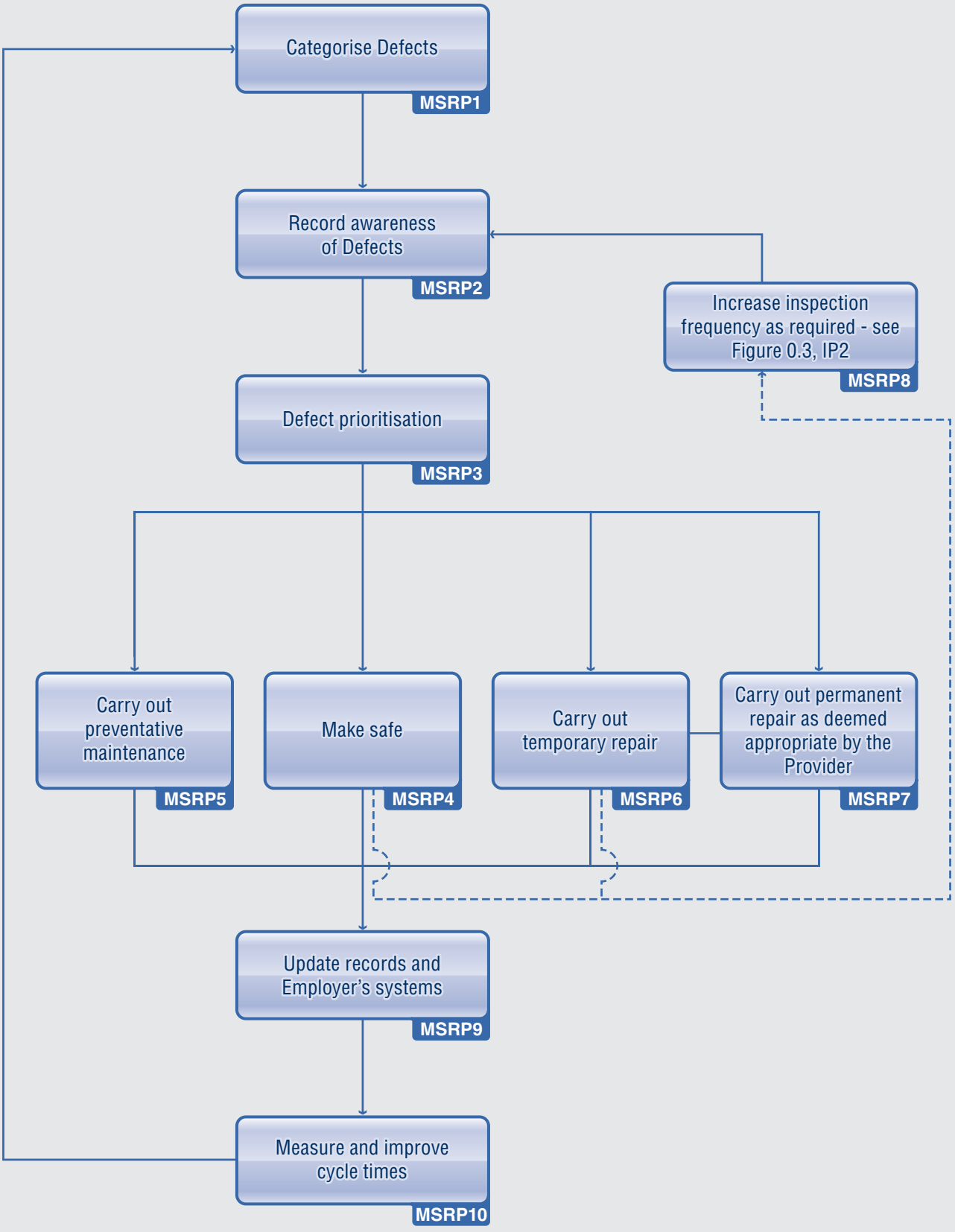
The Provider must include fully detailed Processes, Procedures and timescales in his Quality Plan in relation to inspection, make safe and repair of the asset.

Figure 0.3 Risk Based Inspection Process



Risk Based Inspection Process – Activity Notes		
IP1	Establish all sources of information about condition data	During the Mobilisation Period the Provider must review existing records and establish all sources of information where knowledge can be gained about asset condition. The Provider must take all reasonable care to identify parts of the Area Network that are likely to cause danger to users of the highway.
IP2	Establish risk characteristics for each Maintenance Requirement	There will be different risk characteristics for each Maintenance and Operational Requirement i.e. the different types of risk that could affect achievement of the Provider Outcomes or cause a danger to users of the highway. The Provider must establish these risk characteristics in the context of the variable nature and character of the Area Network i.e. a normally low risk may become a high risk depending on its context in the Area Network – the Provider must understand these conditions.
IP3	Develop programme of inspections based on risk characteristics	The Provider develops a programme of inspections for each Maintenance Requirement recognising the risk characteristics. The programme must be coordinated in order to avoid unnecessary lane closures.
IP4	Undertake inspections	In addition to any Procedures mandated by the Employer, the Provider must have Procedures in place for undertaking inspections. The Provider must have mechanisms in place for checking and controlling the quality of inspections. The Provider takes the opportunity to undertake preventative maintenance or make safe Defects following inspections.
IP5	Update records and Employer's systems	The Provider updates his own systems as necessary and also the Employer systems in accordance with the requirements of Annex 25 of the Service Information (Integrated Asset Management).
IP6	Identify Defects that require monitoring, reschedule inspections as necessary and inspect	The Provider monitors Defects that have the potential for deterioration and could cause a risk to the achievement of the Provider's Outcome or cause a danger to the users of the highway. The Provider adjusts his inspection regime accordingly.
IP7	Ensure warning notices of the condition of the Defects are placed as necessary	The Provider displays warning notices of the condition of the highway in relation to Defects that could cause danger to the users of the highway.
IP8	Take photographic evidence	The Provider must take photographic evidence during inspections to be made available as evidence of compliance with these Maintenance and Operational Requirements.

Figure 0.4 Risk Based Make Safe and Repair Process



Risk Based Make Safe and Repair Process – Activity Notes

MSRP1	Categorise Defects	The Provider categorises Defects in order to enable appropriate response times to be developed for inspections and make safe and repair activities. For each category there must be appropriate response times included in his Maintenance Requirements Plan so as to achieve the Provider Outcomes and provide the Employer with a special defence under Section 58 of the Highways Act. The Provider must take account of the physical location of the Defect and the potential danger to users of the highway.
MSRP2	Record awareness of Defects	The Provider records awareness about Defects via the Provider's inspection activity, Watchman role, third party information or any other source of information (see Risk Based Inspection Process, Figure 0.3).
MSRP3	Defect prioritisation	The Provider assesses the condition of Defects to decide what is required to make safe, and whether to carry out preventative maintenance, a temporary or permanent repair. Prioritisation must be made on the basis of risk to achievement of the Provider Outcomes and danger to users of the highway.
MSRP4	Make safe	The Provider ensures that on completion of making safe the Defect there is no danger to the user of the highway.
MSRP5	Carry out preventative maintenance	To avoid deterioration of the asset – this could be for economic reasons i.e. it is better value to incur cost in order to avoid a higher cost later, or more importantly for safety reasons to avoid deterioration of the Defect that could cause a danger to users of the highway.
MSRP6	Carry out temporary repair	The Provider carries out a temporary repair where he does not carry out a permanent repair.
MSRP7	Carry out permanent repair as deemed appropriate by the Provider	The Provider may choose as he deems appropriate to carry out a permanent repair for economic reasons if it represents better value for money to the Provider as part of his Lump Sum duties to carry out a permanent repair at the time.
MSRP8	Increase inspection frequency as required – see Risk Based Inspection Process (Figure 0.3)	When a make safe or temporary repair has been carried out the Provider must re-evaluate his inspection frequency – in effect he treats the make safe or temporary repair as the equivalent of a new Defect and monitors it accordingly depending on the nature of the repair.

MSRP9	Update records and Employer's systems	The Provider updates his own systems as necessary and also the Employer systems in accordance with the requirements of Annex 25 of the Service Information (Integrated Asset Management). The Provider must have a system for recording photographic evidence showing the condition of the Defect before and after the repair or make safe activity.
MSRP10	Measure and improve cycle times	The Provider must record details of his performance in relation to responding to Defect notifications and making safe or temporary/ permanent repair. From the outset the Provider must utilise the methodology in Annex 14 of the Service Information (Continual Improvement) and employ Lean techniques to optimise the value adding activities, minimise the non-value adding activities and eliminate waste in his Processes and Procedures.

Provider Obligations

The Provider must deliver these Maintenance and Operational Requirements in accordance with all of his obligations under the contract, including but not limited to the following:

1. The Quality Plan must include those Deliverables, Processes and Procedures stated here as being specifically required by the Employer.

2. The key operational processes described above must be adopted by the Provider and included in his Quality Plan

3. The Quality Plan must include for the provision of a Maintenance Requirements Plan (see below for coverage) covering the various Maintenance Requirements, and there must be separate plans for the operational areas covering Severe Weather Service, Incident Response and Managing Network Occupancy as required by Annex 24 of the Service Information (Quality Plan Framework). The plans must detail exactly what activities the Provider is going to undertake to deliver the Provider Outcomes and avoid danger to users of the highway including timescales resource levels, frequency of operations, and work outputs. They must include any activities undertaken by the Provider's suppliers. The various plans must be kept updated as required.

4. In developing his Quality Plan in respect of these Maintenance and Operational Requirements the Provider must adopt the Quality Policy themes covered by Annex 24 of the Service Information (Quality Plan Framework) e.g. where cycle time is an important part of delivering the outcome the Provider must take account of the 'Fast' theme when designing his Processes and Procedures.

5. The Provider carries out these Maintenance and Operational Requirements in compliance with all laws, statutes, regulations, by-laws, directives, rules and government orders applicable

to the Employer, Provider or the Services to the extent that they are applicable to any part of the Services.

6. The Provider carries out these Maintenance and Operational Requirements in accordance with all Health and Safety requirements stated in the Service Information.

7. Where any document, Process or Procedure is stated in these Maintenance and Operational Requirements, these are deemed to be the latest versions.

8. All hold points are observed and the Provider has documented release mechanisms in place, as defined within the Maintenance Requirements.

9. Where the Provider's activities need to be co-ordinated with Others (e.g. Employer's contractors) or different parts of the Employer's organisation (e.g. Traffic Officers) the Provider ensures that the activity interfaces are effectively and efficiently managed.

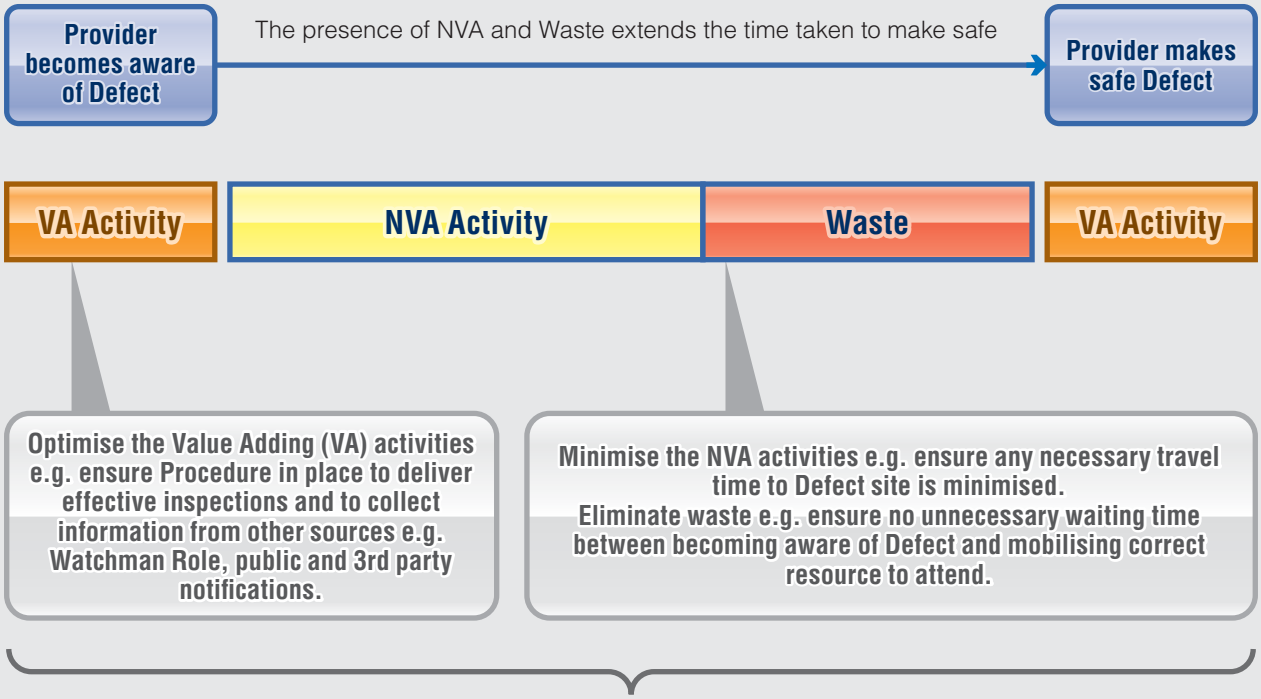
10. The Provider uses Processes and Procedures that are cost and time efficient, ensuring that value adding activities are optimised, non-value adding activity is minimised, and waste is eliminated. Continual improvement opportunities must be sought utilising the mechanisms covered by Annex 14 of the Service Information (Continual Improvement) to reduce cycle times, and generate efficiency savings and innovations required by Clause 53 and 54 respectively of the Conditions of Contract. Figure 0.5 overleaf gives an example of the application of these principles.

Figure 0.5 Continual Improvement Principles

Utilisation of Lean process design and continual improvement principles for Maintenance and Operational Requirements

Make safe Defect example

Reducing cycle times by minimising Non Value Adding (NVA) and eliminating waste improves safety as well as reducing cost.



Maintenance Requirements Plan (MRP)

This is the Provider's plan for delivering the Maintenance Requirements described in this document, and as a minimum it must cover the following:

1. Details of sources of information about condition data, including the identification of asset data gaps and a mitigation approach.

2. The Provider's risk based Processes and Procedures for Inspection and Make Safe and Repair including taking into account the Employer's requirements covered in the key operational processes described above.

3. Detail of risk assessments of the Area Network (refer to Identify Maintenance Requirements Subprocess in Annex 24 of the Service Information - Quality Plan Framework) and assumptions made about categorisation and prioritisation of Defects.

4. Programme of inspections.

5. Response and repair timescales covering Defect identification, verification, response and repair.

6. How work is packaged to minimise network occupancy (including road space booking requirements, TM requirements and Temporary Traffic Regulation Orders).

7. Hold points with release mechanisms specific to each Maintenance Requirement.

8. Details of planned preventative maintenance including programme, who is going to undertake the work, frequency of operations, timescales. The same level of detail is required for activities undertaken by Provider's suppliers.

9. The plan is a 'live document' and must be updated accordingly.

10. MRP Hold Point	
	Description: The Provider must prepare and submit the Maintenance Requirements Plan in accordance with Part 0 of the Maintenance and Operational four weeks prior to Access Date.
	Release Mechanism: Written acceptance by the Service Manager of the Maintenance Requirements Plan.

Sustainability requirements

The Provider adopts four key sustainability principles in relation to the delivery of the Maintenance and Operational Requirements:

1. Resources are used efficiently including:
   - Reduction in material consumption
   - Implementation and promotion of energy saving procedures
2. The impact on the environment is mitigated including:
   - Implementation and promotion of a reduction in waste including preparation and implementation of Site Waste Management Plans in accordance with current regulations
   - Implementation and promotion of the re-use and recycling of materials
   - Effective use and application of design objectives/principles to prevent negative environmental impacts
3. Climate change resilience developed including:
   - Implementation and promotion of a reduction in carbon emissions
4. Inclusion principles operated including:
   - Implementation of diversity and equal opportunity principles
   - Implementation of a skills/ apprenticeships policy

Governance

The Provider may propose a Departure from the Maintenance and Operational Requirements contained in this document.

Proposed Departures must be submitted in accordance with the Departures Submission guidance, the latest version of which may be downloaded from the WebDAS website. The mechanism for submitting such a Departure is the Employer's WebDAS system, which can be accessed at http://webdas/login.aspx

Any change to these Maintenance and Operational Requirements must be instructed by the Service Manager.

Part 1

Watchman Operational Requirement

Version 1.7

Part 1 – Watchman Operational Requirement		
Scope: Activities to monitor, collect data, analyse and provide performance intelligence across all Maintenance and Operational Requirements relevant to the performance of the Area Network; this will cut across the Provider's organisational structure.		
Provider Outcomes: 1. Effective stewardship of the Area Network and of all Provider activities. 2. Optimisation of all Maintenance and Operational Requirements individually and holistically. 3. Continual Improvement of all Maintenance and Operational Requirements individually and holistically. 4. The delivery of individual Maintenance and Operational Requirements is effectively managed to ensure no detrimental effects on the delivery of other Maintenance and Operational Requirements.	**Performance Metric:**	**Performance Requirement Level:**

Deliverables:	**Performance Metric:**	**Performance Requirement Level:**
1. Produce, maintain and implement a Watchman Plan to outline Provider Processes and Procedures for the Watchman Requirement.	Compliance with the accepted Watchman Plan	100%
2. Analyse data and information about the Area Network from all available sources to make intelligence led decisions regarding Maintenance and Operational Requirements.		
3. Co-ordinate inspections called for in the Maintenance and Operational Requirements in order to minimise the number of inspections.		
4. Understand the character of the Area Network and continually horizon scan to identify risks and potential problems; consider the breadth of their potential impact on the performance and resilience of the Area Network, and address them proactively.		
5. Share intelligence and make recommendations to the Employer for managing and optimising performance of the asset and optimising the operation of the Area Network.		
6. Use intelligence to ensure that Schemes proposed are based on the prioritised needs of the Area Network and that the Maintenance and Operational Requirements have been fulfilled before a Scheme is proposed.	No. of Schemes which have been submitted to value management without clear evidence that the Maintenance Requirements have been fulfilled.	Zero
7. Provide a report that details, as a minimum, all matters performed by the Provider in relation to the Watchman Requirement every quarter.		
Processes:		
1. Ensures that the Provider's management systems support the effective operation of the Maintenance and Operational Requirements.		

Procedures: 1. No Employer requirements; in accordance with the Quality Plan the Provider is to design appropriate Procedures required as part of his Processes to produce the Deliverables in order to achieve the Provider Outcomes. 2. In consultation with your HA regional Emergency Planning Team, produce & maintain appropriate contingency plans and working documents, ensuring most recent Crisis Management Manual version is used as a reference and 'guide template'.		

Watchman Operational Requirement - Hold Point		
No.	Hold Point	Release Mechanism
1.	The Provider must prepare and submit the Watchman Plan two weeks prior to Access Date.	Written acceptance by the Service Manager of the Watchman Plan.

Part 2

Managing Network Occupancy Operational Requirement

Version 1.6

Part 2 – Managing Network Occupancy Operational Requirement		
Scope: All Occupancies on the Area Network. All Activities which adversely impact on road users of the Area Network.		
Provider Outcomes:	**Performance Metric:**	**Performance Requirement Level:**
1. Complete knowledge of all Occupancies of the Area Network.		
2. Complete knowledge of all Activities which adversely impact on road users of the Area Network.		
3. All Occupancies are managed to secure the expeditious movement of traffic on the Area Network and facilitate the expeditious movement of traffic on road networks for which another authority is the traffic authority.	Number of Occupancies where predicted Additional Delay exceeded acceptable levels and no departure is approved	Zero

Deliverables:	**Performance Metric:**	**Performance Requirement Level:**
1. Produce, maintain and implement a Network Occupancy Plan to outline Provider Processes and Procedures for Managing Network Occupancy (MNO).	Compliance with the accepted Network Occupancy Plan	100%
2. Produce, develop and implement a Planned Events Calendar.		
3. Fully populated, maintained and updated record of all Occupancies of the Area Network.		
4. Fully populated, maintained and updated record of all Activities which adversely impact on road users of the Area Network.		
5. Proactively identify all Occupancies of the Area Network.		
6. Proactively identify all Activities that will impact on road users of the Area Network.		
7. Control the timing and/or duration of all individual Occupancies.		
8. Optimise all Occupancies.		
9. Minimise the effect of Activities that adversely impact on road users of the Area Network.	Number of Activities where predicted Additional Delay exceeded acceptable levels	Zero
Processes:		
No Employer Requirements; in accordance with the Quality Plan and Network Occupancy Plan the Provider is to design appropriate Processes to produce the Deliverables in order to achieve the Provider Outcomes.		

Procedures:	Performance Metric:	Performance Requirement Level:
1. Operate Scheduled Road Works (SRW) system or any successor. The system must be fully and accurately populated with all Activities and Occupancies. SRW data must accurately reflect impact on road users and other stakeholders. For any lane closures resulting in the availability of only a single running lane or less in any one direction or a carriageway closure immediately between an off slip road and an on slip road, Closure Records on SRW must not be amended after 1 13.00hrs on the day of the closure for closures between 19.00 hrs and 24.00 hrs, 2 13.00hrs on the day preceding the closure for closures between 00.01 hrs and 19.00 hrs, unless, in exceptional circumstances, the amendment is due to safety, an incident or weather conditions which could not have been reasonably foreseen. This requirement applies to start times, changes to traffic management layout and end times except for early finishes to end times. Any failure to comply with the above requirement with regard to end times which overrun will still be subject to the requirement of paragraph (e) below. Closure Records on SRW must be confirmed within 15 minutes;		
a. before the start of the Activity or Occupancy. This includes the time of the first action that has the potential to adversely impact the users of the Area Network.	Percentage of Closure Records confirmed within 15 minutes before the last SRW published start.	100%
b. before any change to the traffic management that will adversely impact users of the Area Network during the Activity or Occupancy.	Percentage of Closure Records confirmed within 15 minutes before any change.	100%

continues

Procedures:	Performance Metric:	Performance Requirement Level:
c. after any significant change to the traffic management that will beneficially impact users of the Area Network during the Activity or Occupancy.	Percentage of Closure Records confirmed within 15 minutes after any change.	100%
d. after the end of the Activity or Occupancy. This is the time of the last action taken to beneficially impact users of the Area Network.	Percentage of Closure Records confirmed within 15 minutes after the end.	100%
e. before the last SRW published end when the end time is going to overrun.	Percentage of Closure Records updated within 15 minutes before any overrun.	100%
Provisional and firm Closure Records must be entered into SRW in accordance with the requirements of Table 2.1.	Percentage of SRW records complying with provisional and firm booking timescales in Table 2.1.	100%
Revisions to Closure Record start dates which result in a notice period not in compliance with the requirements of Table 2.1 must be approved by the Service Manager.		
All Occupancies must be notified to the RCC by phone in accordance with the following: Call 1: Informing RCC that the workforce is ready to enter the carriageway and requesting signs and signals be set if available; Call 2: Requesting RCC to cancel signs and signals set at call 1 as the cone taper is in place; Call 3: Requesting RCC to set signs and signals again, if available, as traffic management is about to be removed;		

continues

Procedures:	Performance Metric:	Performance Requirement Level:
Call 4: Informing RCC that the entire traffic management is removed and/or workforce is clear of the carriageway and to cancel signs and signals set at call 3. Any changes to traffic management layout must also be called in to the RCC at the start and the end of the change.		
A cancellation or a postponement to a SRW published record must be notified to the RCC and SRW must be updated accordingly.	Percentage of SRW Closure Record cancellations or postponements updated before the last SRW published start date and time.	100%
The Provider must provide the RCC and NTOC with the contact name(s) and telephone number(s) of whoever can supply SRW updates and notifications before any closure is implemented and/ or updated. This information must be valid for the whole duration of the closure. Data field population requirements for SRW can be found in the HAPMS - SRW on line user documentation. These requirements must be adhered to unless otherwise mandated in this document or by the Service Manager. Section 2.4 of the Scheduled Road Works Manual Version 5.02 does not apply to this contract. Providers must access HAPMS via their Highways Agency extranet or ISDN connections. Expected delay values (Scheduled Road Works Manual Version 5.02, Section 6.3.1.3) entered onto SRW must be taken from predicted Additional Delay values determined for the Occupancy or Activity. These will align to the values given in Table 2.2.		

continues

Procedures:	Performance Metric:	Performance Requirement Level:
2. Comply with the Highways Agency's New Roads and Street Works Act (NRSWA) Best Practice Guide. 3. Network Occupancy Plan to include but not be exclusive to; a. Communications Protocol b. Occupancy booking procedures and proformas c. Details of the Intelligence Led Approach to MNO including embargoes, restrictions, Service Manager instructions in accordance with Appendix 2.1 d. Specific details on the arrangements for the particular local operating regime in place for a Smart Motorway section of the Area Network e. Provisional and Firm Challenge, and Optimisation procedures in accordance with Appendices 2.2, 2.3 and 2.4 f. Performance measurement details g. Local agreements (e.g. Detailed Local Operating Agreements) h. Innovation – including use of the JTR Toolkit and portable variable message signs. *continues*		

Procedures:	**Performance Metric:**	**Performance Requirement Level:**
4. Planned Events Calendar to include but not be exclusive to; a. Planned Event reference number the Provider requires for identification/ tracking b. Planned Event description/title c. Planned Event location d. Start date e. End date f. Start time g. End time h. Expected number of attendees i. Planned Event Risk Category in accordance with Appendix 2.6 j. Details of any requirements in terms of suspension of any other planned Occupancy – state the suspension location and times (this information must also be used by the Provider as an 'early warning' to avoid unnecessary planning of roadworks) k. Promoter/contact details l. Routes affected m. Likely traffic impact and expected delay (where possible) *continues*		

Procedures:	**Performance Metric:**	**Performance Requirement Level:**
5. Challenge provisional and firm Closure Records in SRW to ensure the proposed timings durations and traffic management configurations are appropriate in respect to the individual booking and the overall Occupancy of the Area Network in accordance with Appendices 2.2, 2.3 and 2.4. 6. Review all Planned Events in relation to their potential to have a negative impact on road users of the Area Network in terms of Additional Delay and reliability in accordance with Appendix 2.6. 7. Manage the impact of Abnormal Indivisible Load Movements in accordance with Appendix 2.7. 8. Manage the applications for temporary traffic signs for special events in accordance with Appendix 2.8. 9. Motorway passes must be applied for and granted in accordance with Appendix 2.9.		

Managing Network Occupancy Operational Requirement - Hold Point		
No.	Hold Point	Release Mechanism
1.	The Provider must prepare and submit the Network Occupancy Plan two weeks before Access Date.	Written acceptance by the Service Manager of the Network Occupancy Plan.

continues

Table 2.1 Timescale requirements for population of SRW in advance of the Activity/Occupancy.

Reference activity	Occurrence	SRW activity	Closure type	Provisional Closure Record	Firm Closure Record
A	Major schemes delivered through the Major Project Directorate.	Major schemes	Planned works	24 months	6 months
B	Improvement schemes delivered through NDD Directorate	Area schemes	Planned works	6 months	3 months
C	Renewal schemes delivered through NDD Directorate	Area renewals	Planned works	6 months	3 months
D1	Planned routine works delivered through NDD Directorate	Routine works	Planned works	6 months	3 months
D2	Minor unplanned routine works	Routine works	Planned works	14 days	7 days
E	Emergency and urgent routine works.	Routine works	Emergency works	N/A	15 minutes
F	Technology schemes managed through the Provider.	Technology schemes	Planned works	6 months	3 months
G1	Programmed regional technology works including fault category T1 and T2 - permanent repair works delivered by the RTMC.	Technology works	Planned works	3 months	1 months
G2	Regional technology works fault category T2 - restore service works delivered by the RTMC.	Technology works	Planned works	1 month	14 days
H	Emergency, extra urgent, urgent and category T1 (restore service) regional technology works.	Technology works	Emergency works	N/A	15 minutes
I1	Street Works (Major)	Street works	Planned works	3 months	10 days
I2	Street Works (Standard)	Street works	Planned works	N/A	10 days
I3	Street Works (Minor)	Street works	Planned works	N/A	3 days
J	Street Works (Immediate)	Urgent street works	Emergency works	N/A	-2 hours

Table 2.1 Timescale requirements for population of SRW in advance of the Activity/Occupancy.

Reference activity	Occurrence	SRW activity	Closure type	Provisional Closure Record	Firm Closure Record
K	Developer works	Developer works	Planned works	6 months	3 months
L	Licensee Works	Licensee works	Planned works	3 months	1 month
M	Technology schemes not managed by the Provider	National technology works	Planned works	6 months	3 months
N	Emergency and urgent technology works not delivered by the RTMC. This includes unplanned works which could not have been reasonably foreseen.	National technology works	Emergency works	N/A	15 minutes
O	Special Order Abnormal Indivisible Loads	Abnormal Load – Special Order	Planned Works	N/A	5 days
P	Incidents	Incidents	Incidents	N/A	In accordance with the requirements for notifying the RCC and NTIS as specified in AMOR Part 3.
Q	Activities	Events	Events	15 weeks	7 days

Table 2.2 Expected delay values for SRW population.

Severe	Estimated delay of over 30 minutes.
Moderate	Estimated delay of between 10[1] or 15[2] and 30 minutes.
Slight	Estimated delay of less than 10[1] or 15[2] minutes.
No Delay	Closures that are expected to cause no Additional Delay.

[1] Applicable to All Purpose Trunk Roads
[2] Applicable to Motorways.

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Part 3

Incident Response Operational Requirement

Version 1.10

Part 3 – Incident Response Operational Requirement		
Scope: All Incidents within the Area Network as notified by the Traffic Officer Service (Regional Control Centres (RCC) and Traffic Officers) or Emergency Services, or when identified by the Service Provider.		
Provider Outcomes: 1. Asset made safe following all Incidents. 2. Robust Incident based intelligence. 3. All Incidents are managed to secure the expeditious movement of traffic on the Area Network and facilitate the expeditious movement of traffic on road networks for which another authority is the traffic authority.	**Performance Metric:**	**Performance Requirement Level:**
Deliverables: 1. To produce, maintain and implement an Incident Response Plan to outline Provider Processes and Procedures for Incident Response. 2. To establish and maintain clear lines of communication with the Service Manager, Traffic Officer Service (TOS) (including RCCs), other Incident responders and stakeholders when dealing with Incidents, including between the Incident scene and the Network Control Centre (NCC). 3. To establish and maintain a 24/7 communications link with the National Roads Telecommunications Service (NRTS) and the Regional Technology Maintenance Contractor (RTMC), and provide Traffic Management to support these services upon request. *continues*	Compliance with accepted Incident Response Plan	100%

Deliverables:	Performance Metric:	Performance Requirement Level:
4. To assess Provider response requirements for Incidents that occur within the Area Network, when notified by the Traffic Officer Service (TOS), Emergency Services, or when identified by the Provider, and respond if necessary.		
5. To produce and record a Tactical Incident Response Plan (TIRP) upon notification or identification of an Incident to outline the immediate steps the Provider will undertake to make safe the asset to ensure that the expeditious movement of traffic on the Area Network is secured and the expeditious movement of traffic on road networks for which another authority is the traffic authority is facilitated. This must include Incidents when the decision is made not to attend. A TIRP must be recorded on the Provider's control log. The TIRP must detail the level of Provider response required, planned actions to make safe the asset and estimated time to Incident clearance. Once this information is recorded on the TIRP, it must be made available if requested by the RCC. The production of the TIRP is the end of the response phase of the Incident.	Measure and report on the Performance Metrics in accordance with Table 3.1 (Performance Metric 1)	Meet the Performance Requirement Levels set out in Table 3.1
6. To make safe (including mobilisation to make safe) the asset and ensure that following all Incidents the expeditious movement of traffic on the Area Network is secured and the expeditious movement of traffic on road networks for which another authority is the traffic authority is facilitated.	Measure and report on the Performance Metrics in accordance with Table 3.1 (Performance Metric 2 and Performance Metric 3).	Meet the Performance Requirement Levels set out in Table 3.1
7. To provide Emergency Traffic Management (ETM) and Temporary Traffic Management (TTM) for Incidents upon request.		
continues		

Deliverables:	Performance Metric:	Performance Requirement Level:
8. To provide the following details of Critical and Major Incidents to the RCC and National Traffic Information Service (NTIS) at the time of the Incident: Incident location, Incident description, direction(s) of travel affected and estimated delays to journey time.		
9. To report on and record information on all Incidents attended by the Provider.		
10. To report on Critical and Major Incidents immediately following each occurrence	Report on Critical and Major Incidents in accordance with Table A 3.1.1 (in Appendix 3.1)	Meet the Performance Requirement Levels set out in Table A 3.1.1 in Appendix 3.1
11. To notify the Police and the Highways Agency if the Provider believes a Critical Incident is or may become a Major Incident.		
12. To produce and implement an Area Contingency Plan.		
13. To establish and maintain a supply chain for the provision of specialist services to resolve Incidents.		
14. To notify the RCC and NTIS of the implementation and removal of lane restrictions.	Within 15 minutes of implementation, and / or removal of lane restrictions	100%
15. To implement the use of Emergency Diversion Routes (EDRs) following Area Network closures or when requested by the TOS / Emergency Services.		
Processes:		
1. Maintain and safeguard the communication system and operating equipment in full working order. Any maintenance, repair, replacement costs or other costs incidental to safeguarding the equipment shall be at the expense of the Provider.		

Procedures:	Performance Metric:	Performance Requirement Level:
1. Incident response will be conducted in partnership between the TOS and Providers. 2. Prepare, implement and maintain an Area Contingency Plan ensuring full alignment and compatibility with most recent Crisis Management Manual version. 3. Put in place an approved code of practice for the communication system and ensure all authorised users conform with the code. 4. Obtain the relevant licence for use with the communication system. 5. When dealing with the setting up, maintenance and removal of Emergency Traffic Management arrangements, Providers must follow the procedures within 'Traffic Signs Manual Chapter 8, Section 07: Incident Management'. 6. Report on Incidents attended in accordance with the Incident Data Standard. 7. The Provider must have in place arrangements with HAZMAT accredited specialist waste companies. 8. At Police led Incidents, permission must be sought from the Police before photographic images of damage to Crown property by third parties are taken. At HA led Incidents, this activity must be done in consultation with the TOS. 9. The Provider must pass all media enquiries to the Highways Agency press office and also notify the Service Manager. *continues*		

Procedures:	Performance Metric:	Performance Requirement Level:
10. The Provider must familiarise themselves with the following documents, and make themselves conversant with their procedures: • Emergency Response and Recovery: Non Statutory Guidance to Complement Emergency Preparedness • Traffic Incident Management Guidance Framework • Standard Incident Management Framework • National Guidance Framework for Operational Activities (LHA NGF) between Local Highway Authorities and the Highways Agency • Detailed Local Operating Agreements • The ACPO Road Death Investigation Manual • Highways Agency National Vehicle Recovery Contract 11. Manage new and existing EDRs in accordance with the EDR procedures in Appendix 3.3. 12. Providers must attend and participate in Hot, Cool and Cold post Incident debriefs in accordance with the Highways Agency Debriefing Guidance and most recent Crisis Management Manual version. 13. Report to the Bronze Scene Commander on arrival at and departure from an Incident scene. The Bronze Scene Commander will normally be a Police Officer or Traffic Officer, but could also be a Provider representative. Where Providers pass scene command to a Police Officer or Traffic Officer, a full verbal handover must be undertaken and recorded on the Provider's control log. *continues*		

Procedures:	Performance Metric:	Performance Requirement Level:
14. If a TOS rolling road block is required on the network patrolled by the TOS, the Provider must contact the RCC to make the necessary arrangements. The TOS will only provide rolling road blocks on a strictly limited basis when their resources allow and in accordance with their legal powers. 15. Where local Area specific operating agreements are required between the TOS and the Provider, they must be documented and agreed in a Local Joint Operating Principles Document (Appendix 3.4). 16. Request appropriate Variable Message Signs (VMS) via the RCC when undertaking all activities in live carriageways to offer additional protection for the Provider workforce and other responders. 17. At all times be aware and proactively track the Incident Command Escalation Stages. Be prepared to action and fulfil designated roles according to relevant ICES status as outlined in the Crisis Management Manual. 18. The Provider carries out activities in a manner that ensures the Employer is able to fully meet responsibilities and duties as a 'Category 2 responder' as detailed within the Civil Contingencies Act (CCA) 2004'.		

Incident Response Operational Requirement - Hold Point		
No.	Hold Point	Release Mechanism
1.	The Provider must prepare and submit the Incident Response Plan four weeks prior to Access Date.	Written acceptance by the Service Manager of the Incident Response Plan.

Table 3.1

Incident Response Performance Metrics and Performance Requirement Levels

Highways Agency[*1] Led Incidents						
			Performance Metric 1 100% Compliance (minutes)		**Performance Metric 2** 100% Compliance (minutes)	
Road Type	Time of Day	Road Traffic Levels	**a)** Maximum duration from Provider Incident notification[*2] from TOS / Emergency Services / Others through to production of Provider Tactical Incident Response Plan (TIRP).	**b)** Maximum duration from Provider Incident self-identification[*3] through to production of Provider Tactical Incident Response Plan (TIRP).	**a)** Rolling 28 day mean: For all Provider attended notified[*2] Incidents, duration from notification[*2] of carriageway compromise[*4] through to carriageway opening[*5].	**b)** Rolling 28 day mean: For all Provider attended self- identified[*3] Incidents, duration from identification[*3] of carriageway compromise[*4] through to carriageway opening[*5].
Motorway	Day[*6]	Heavy[*8]	30	10	70	50
Motorway	Day	Light[*8]	45	25	90	70
Motorway	Night[*7]	All	60	40	120	100
APTR - dual	Day	Heavy	30	10	70	60
APTR - dual	Day	Light	45	25	90	80
APTR - dual	Night	All	60	40	120	100
APTR - single	Day	Heavy	30	10	50	40
APTR - single	Day	Light	45	25	70	60
APTR - single	Night	All	60	40	100	90

Emergency Services Led Incidents				
			Performance Metric 1 100% Compliance (minutes)	**Performance Metric 3** 100% Compliance (minutes)
Road Type	Time of Day	Road Traffic Levels	**a)** Maximum duration from Provider Incident notification[*2] from TOS / Emergency Services / Others through to production of Provider Tactical Incident Response Plan (TIRP).	Rolling 28 day mean: From Incident command handover from the Emergency Services to the HA, through to carriageway opening[*5].
Motorway	Day[*6]	Heavy[*8]	30	70
Motorway	Day	Light[*8]	45	90
Motorway	Night[*7]	All	60	120
APTR - dual	Day	Heavy	30	70
APTR - dual	Day	Light	45	90
APTR - dual	Night	All	60	120
APTR - single	Day	Heavy	30	50
APTR - single	Day	Light	45	70
APTR - single	Night	All	60	100

Defined Terms / Notes

*1 Can be the TOS or the Provider.

*2 Refers to those Incidents of which the Provider has no knowledge until they are passed to the Provider's control centre via telephone from the TOS (RCC), Emergency Services, Others or Provider resource which can not work on live lane Incidents. The measurement period starts when the phone call ends.

*3 Refers to those Incidents of which the Provider has no knowledge until they discover them whilst on patrol or carrying out other duties on the Area Network. Self-identified Incidents are only those which are discovered by Provider resource which can work on live lane Incidents. The measurement period starts when the Incident is discovered.

*4 Describes the situation when a live running lane is partially or fully obstructed by an Incident.

*5 Describes the situation when a live running lane, which was partially or fully obstructed by an Incident, fully re-opens.

*6 'Day' is 0400 – 2000 hrs.

*7 'Night' is 2000 – 0400 hrs.

*8 Classification of 'Heavy' and 'Light' traffic levels across the Area Network are detailed in Annex 13 of the Service Information: Additional Performance Requirements to AMOR.

Part 4

Severe Weather Operational Requirement

Version 1.3

Part 4 – Severe Weather Operational Requirement		
Scope: Provision of a Severe Weather Service (as defined in the Severe Weather Plan template, Appendix 4) for the Area Network.		
Provider Outcomes: 1. Safe passage on the Area Network is not endangered by ice or snow, as far as is reasonably practicable. 2. Minimised risk to safe passage posed by fog, high temperatures, heavy rain, high winds.	**Performance Metric:**	**Performance Requirement Level:**
Deliverables:		
1. To produce, maintain and implement a Severe Weather Plan to outline Provider processes and procedures for Severe Weather.	Compliance with planning, preparing and reporting requirements of the Severe Weather Plan	100%
	Compliance with Operational Requirements of the Severe Weather Plan	100%
2. Precautionary treatments for each route (including turnaround) delivered within the precautionary treatment and turnaround time as stated in the Severe Weather Plan.	Percentage of routes treated within the target treatment time (measured by HA's winter fleet data logging system)	100%
3. Minimum number of lanes kept clear of snow in accordance with the snow clearance requirement table within the Severe Weather Plan.	Report by exception	100%
4. Carriageways cleared of snow following cessation of snow in accordance with the snow clearance requirement table within the Severe Weather Plan.	Compliance will be verified by sample audits, as specified by the Service Manager	100%
5. Winter Reporting Form 1 (WRF1) populated throughout the Winter Period.	Compliance with WRF1 reporting requirement	95%

Processes:	**Performance Metric:**	**Performance Requirement Level:**
1. Refer to Severe Weather Plan template. 2. Refer to Salt Restocking Plan template.		
Procedures: *No Employer requirements; in accordance with the Quality Plan and Severe Weather Plan the Provider is to design appropriate Procedures required as part of his Processes to produce the Deliverables in order to achieve the Provider Outcomes.*		

Severe Weather Operational Requirement - Hold Points		
No.	Hold Point	Release Mechanism
1.	The Provider must prepare the Severe Weather Plan in accordance with the Severe Weather Plan template.	Written acceptance of the Severe Weather Plan from the Service Manager and the Highways Agency National Winter and Severe Weather Team.
2.	The Provider must prepare the Salt Restocking Plan in accordance with the Severe Weather Plan template.	Written acceptance of the Salt Restocking Plan from the Service Manager and the Highways Agency National Winter and Severe Weather Team.

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Part 5

Drainage Maintenance Requirement

Version 1.2

Part 5 – Drainage Maintenance Requirement

Scope:

The system within the Area Network which removes water from trafficked surfaces, sub-layers and other parts of the highway asset, including components from the point at which water drains from paved or other areas to the outfall.

Out of Scope:

Structural maintenance of culverts with a clear span or internal diameter greater than 0.9m (which are included in the Structures Maintenance Requirements).

Provider Outcomes:	Performance Metric:	Performance Requirement Level:
1. The drainage system is managed and maintained to minimise the risk of Flood Events on trafficked surfaces and remove standing water from trafficked surfaces.	Number of Flood Events on trafficked surfaces.	Zero
2. The drainage system is managed and maintained to remove sub-surface water to enhance the longevity of paved areas and associated earthworks.		
3. The drainage system is managed and maintained to minimise the risk of pollution to receiving water courses.	Number of enforcement actions associated with highway discharges.	Zero

Deliverables:	Performance Metric:	Performance Requirement Level:
1. Implement the Maintenance Requirement Plan (MRP) with regards to Drainage Maintenance Requirements. Execute inspections to verify asset information and establish condition.	Compliance with accepted MRP	100%
2. Validate risk status of Priority Drainage Assets in descending order of priority from risk status A to D. Set out the approach to validation in the MRP.	Compliance with accepted MRP	100%
3. Nominate to the Service Manager, individual(s) to fulfil the roles of Drainage Liaison Engineer and Flood Champion.		
4. Record details of Flood Events.	Time from notification to flood event set to 'Closed' status	28 days
5. Validate Flood Hotspots identified in Highways Agency Drainage Data Management System. Set out the approach to validation in the MRP.	Compliance with accepted MRP	100%
6. Make safe drainage system Defects.	Time taken to make safe Defects (from notification or inspection to restoration of safe operation; note may not be permanent repair)	[No Performance Requirement Level set]
7. Ensure drainage system components are managed in accordance with the accepted MRP.	Compliance with accepted MRP	100%
Processes:		
No Employer requirements; in accordance with the Quality Plan and Maintenance Requirements Plan the Provider is to design appropriate Processes to produce the Deliverables in order to achieve the Provider Outcomes.		

Procedures:	**Performance Metric:**	**Performance Requirement Level:**
1. Verify asset risk assessments and investigate risk status A Priority Drainage Assets in accordance with guidance documentation hosted on the Downloads section of www.haddms.com . 2. Drainage Liaison Engineer to be key point of contact for the Service Provider for drainage related matters, and to assume responsibility for drainage surveys, maintenance and renewals. 3. Comply with specifications for the drainage asset as set out in relevant parts of MCHW Volumes 1, 2 and 3. 4. Manage to minimise pollution risk in accordance with HD 45. 5. Control drainage waste arisings such that they comply with legislation at the point of disposal. 6. Record asset data as defined in the Provider contract and the Asset Data Management Manual Provider Requirements.		

Part 6

Fences, Screens and Environmental Barriers Maintenance Requirement

Version 1.2

Part 6 – Fences, Screens and Environmental Barriers Maintenance Requirement		
Scope: All types of fences, screens and environmental barriers within the Area Network, inclusive of walls, stock proofing and wildlife fences. **Out of Scope:** structural maintenance of fences, walls, screens and environmental barriers classified as structures (i.e. >3m high).		
Provider Outcomes: 1. Fences, screens and environmental barriers are safe and stable and fulfil their intended safety purpose. 2. Fences, screens and environmental barriers are managed to identify Defects that would adversely impact upon their intended functional purpose.	**Performance Metric:**	**Performance Requirement Level:**
Deliverables:		
1. Implement the Maintenance Requirements Plan (MRP) with regards to Fences, Screens and Environmental Barriers Maintenance Requirements.	Compliance with accepted MRP	100%
2. Execute inspections to identify Defects on fences, screens and environmental barriers; and to verify, challenge and update ownership and maintenance responsibilities, as defined in the Provider contract.	Compliance with accepted inspection regime.	100%
3. Where inspections or third parties identify adjacent landowner's fences, screens or environmental barriers as defective, immediately inform the responsible party of their obligation to rectify Defects.	Ownership and maintenance status verified at all inspected sites	100%
4. Rectify Defects which prevent the fence, screen or environmental barrier from fulfilling its intended safety purpose.	Number of Defects related to safety performance	Zero
	Time taken to make safe Defects (from notification or inspection to restoration of safe operation; note may not be permanent repair)	[No Performance Requirement Level set]

continues

Deliverables:	**Performance Metric:**	**Performance Requirement Level:**
5. Rectify Defects which impact on the safety or stability of the fence, screen or environmental barrier	Number of Defects relating to the safety or stability of the asset Time taken to make safe Defects (from notification or inspection to restoration of safe operation; note may not be permanent repair)	Zero [No Performance Requirement Level set]
Processes: *No Employer requirements; in accordance with the Quality Plan and Maintenance Requirements Plan the Provider is to design appropriate Processes to produce the Deliverables in order to achieve the Provider Outcomes.*		
Procedures: 1. Record asset data as defined in the Provider contract and the Asset Data Management Manual Provider Requirements. 2. Ensure rectification of Defects complies with specifications for the fences, screens and environmental barrier assets as set out in relevant parts of MCHW Volumes 1, 2 and 3.		

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Part 7

Geotechnical Assets Maintenance Requirement

Version 1.1

Part 7 – Geotechnical Assets Maintenance Requirement		
Scope: Geotechnical assets within the Area Network, comprising: embankment and cuttings on which the pavement and other assets are founded, and noise/ landscape bunds. **Out of Scope:** physical works (inc. surveys and renewals) beyond short term management of safety critical Defects.		
Provider Outcomes:	**Performance Metric:**	**Performance Requirement Level:**
1. Potential Defects with geotechnical assets are identified. 2. Defects are managed to minimise risks to road users. 3. Defects are managed to minimise risk of damage to other assets.	Length (in metres) of Temporary Traffic Management and/or temporary road restraint systems in place on the Area Network as a result of geotechnical Defects	[No Performance Requirement Level set]
Deliverables:		
1. Implement the Maintenance Requirements Plan (MRP) with regards to Geotechnical Assets, which will include the Geotechnical Asset Management Plan (GAMP).	Compliance with accepted MRP	100%
2. Develop a GAMP and submit to the Service Manager for acceptance. Upon Service Manager acceptance implement the GAMP.	Compliance with accepted GAMP	100%
3. In accordance with the accepted GAMP (part of the overall MRP), develop and implement a risk based Principal Inspection regime.	Compliance with accepted GAMP	100%
4. Make safe geotechnical asset Defects which adversely affect the stability, integrity or operation of other highway assets, including but not limited to, paved areas, drainage, communications cables.	Time taken to make safe Defects (from notification or inspection to restoration of safe operation; note may not be permanent repair)	[No Performance Requirement Level set]

Processes:	**Performance Metric:**	**Performance Requirement Level:**
No Employer requirements; in accordance with the Quality Plan and Maintenance Requirements Plan the Provider is to design appropriate Processes to produce the Deliverables in order to achieve the Provider Outcomes.		
Procedures: 1. Undertake activities in accordance with HD 41. 2. Manage risks in accordance with HD 22. 3. Record asset data as defined in the Provider contract and the Asset Data Management Manual Provider Requirements.		

Geotechnical Assets Maintenance Requirement - Hold Point		
No.	Hold Point	Release Mechanism
1.	The Provider must prepare the Geotechnical Asset Management Plan in accordance with HD 41 and submit to the Service Manager.	Written acceptance of the Geotechnical Asset Management Plan by the Service Manager.

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Part 8

Lighting Maintenance Requirement

Version 1.4

Part 8 – Lighting Maintenance Requirement

Scope:

Lighting equipment within the Area Network, specifically:

- Luminaires, including their internal control electronics & electrics (including the photocell if fitted) and lamp & reflector.
- Belisha beacons and vertical wig wag signs at school or animal crossings.
- Lighting columns, including attached accessories, base or, if on a structure, mounting bracket.
- Road traffic sign lighting, including lamp, luminaire, photocell, cables, ducting.
- Other access lighting such as pedestrian walkways, cycle ways and subway lighting.
- The electrical and optical elements of tall mast lighting systems (20m or more in height) and catenary lighting systems.
- Associated electrical supplies, including ducting, chambers, cables and feeder pillars and all switch gear, control equipment (including the photocell if fitted), monitoring equipment and heaters therein.
- Alternate energy sources such as solar panels or wind turbines etc. used for the purpose of road lighting or sign lighting.
- Any energy saving equipment, i.e. midnight switch off equipment and/or dimming equipment.
- Any power distribution cables downstream of the Distribution Network Operator (DNO) connection point.

Out of Scope:

- Lighting situated in road tunnels.
- Road traffic signals.
- The non-electrical and structural elements of tall mast lighting systems (20m or more in height) and catenary lighting systems which are classified as structures.

Provider Outcomes:	**Performance Metric:**	**Performance Requirement Level:**
1. Lighting does not present a hazard to the road user, road worker or third parties. 2. Road lighting continues to fulfil its intended purpose as an accident reduction intervention. 3. Other lighting continues to fulfil its intended purpose: road traffic signs lighting to highlight the location of a road traffic sign, gantry lighting to highlight the presence of the sign and to help read the sign, and other lighting (subway & access) is to provide route guidance and hazard identification.		
Deliverables:		
1. Implement the Maintenance Requirements Plan (MRP) with regards to Lighting Maintenance Requirements. This will include how lighting condition will be maintained to the appropriate level over the following five years. The Lighting Maintenance section within MRP must be reviewed every two years.	Compliance with accepted MRP	100%
2. Develop and implement an annual Lighting Asset Management Plan (LAMP) to demonstrate how the Outcomes and Deliverables will be achieved in the forthcoming year. Review this annually.	Compliance with accepted annual LAMP	100%
continues		

Deliverables:	Performance Metric:	Performance Requirement Level:
3. In the annual LAMP develop and implement a risk based methodology to govern the frequency of: • road lighting electrical testing interval (5 years desirable - 6 years maximum); • road lighting structural inspection interval (5 years desirable starting around 15 years after installation); • road lighting optical maintenance (bulk lamp change and lens cleaning as a minimum) - (5 years desirable minimum); • electrical test, structural inspection & optical maintenance to be completed at least once at each site during the initial term of contract.	Compliance with methodology in accepted LAMP	100%
4. Within 6 months of the Access Date, report on which parts of the asset are not compliant with Deliverable 3. Report these findings to the Employer.		
5. Conduct Lighting Operational Performance Surveys ("scouting") covering the Area Network in order to verify achievement of Outcomes and performance levels. Make all survey data available to the Employer. Execute a survey of the Area Network during the last full week of: April, August, October, November, January and February; report results to Employer by third working day of following month. Execute a survey of the Area Network in the five working days following the 26th of December; report results to the Employer by the tenth working day following the 26th December.	Compliance with Deliverable 5	100%
6. Make safe Defects.	Time taken to make safe Defects (from notification or inspection to restoration of safe operation; note may not be permanent repair)	[No Performance Requirement Level set]
7. Fit an appropriate lamp with a lifespan most closely matched to the target lamp change interval both within and beyond the Provider contract term.	Compliance with lamp change regime set out in Deliverable 3	100%

continues

Deliverables:	Performance Metric:	Performance Requirement Level:
8. Maintain the energy efficiency of lighting.	Change in design energy consumption of lighting before and after maintenance intervention	Zero or less
9. Maintain the effectiveness of energy saving equipment.	Energy saving equipment is available; Energy saving equipment is reliable.	99% 95%
10. Re-use lamps with more than 25% of residual design life remaining.	Waste Electrical and Electronic Equipment (WEEE) disposal records	The maximum number of lamps that can be disposed of during the term of the Provider contract is 120% of the number of lamps installed at the start of the Provider contract.
11. The design life of each lighting scheme is not unduly or avoidably compromised by the actions of the Provider.		
12. Ensure the Employer meets its unmetered energy user obligations to the DNO.		
13. Maintain the energy consumption inventory.	Maintained monthly, defect free	100%

continues

Deliverables:	Performance Metric:	Performance Requirement Level:
14. Manage and maintain road lighting to meet the following performance levels. Where the dates to achieve performance levels in part c) overlap with those required to achieve performance levels in part a), the performance levels in part a) take precedence. Note: With the agreement of the Employer, lighting performance levels may be relaxed, when and where the Provider can clearly demonstrate that (this list is inclusive): I. There has been a failure by third parties (not subcontractors or equipment suppliers) to facilitate or co-operate with fault rectification, or, II. The cause of the fault is such that fault rectification requires substantial remedial works requiring extensive planning and scheduling, or, III. Access to site is not possible due to circumstances wholly outside the control of the contractor, or, IV. The Employer has requested that the fault is not rectified, or, V. A risk assessment has shown that the most appropriate action is to switch off all or the vast majority of lights within the lighting scheme, or, VI. Adverse weather conditions prevent setting out of traffic management, operation of equipment or effective fault rectification.	**a) By last week in October:** i) Max. no. of sequential lamp failures. ii) Max. no. of failures per no. of lamps, on Motorways; APTRs. iii) Overall % lamp failures on, Motorways; APTRs. **b) During operation of Greenwich Mean Time:** i) Max. no. of sequential lamp failures; Failure rectification by next scouting survey. ii) Max. no. of failures per no. of consecutive lamps; Failure rectification within 7 days. iii) Overall % lamp failures on, Motorways; APTRs.	1 4 per 100 1 per 24 Not greater than 2% Not greater than 2% 2 100% 6 per 20 100% Not greater than 3% Not greater than 3%

continues

Deliverables:	Performance Metric:	Performance Requirement Level:
	c) During operation of British Summer Time:	
	i) Max. no. of sequential lamp failures; Failure rectification by next scouting survey.	2 100%
	ii) Max. no. of failures per no. of consecutive lamps; Failure rectification within 7 days.	6 per 20 100%
Processes: 1. Compile and issue to the Service Manager a Condition Report, in accordance with the Lighting Asset Management and Maintenance Manual (LAMMM).		
Procedures: 1. No painting of columns shall be undertaken (unless an analysis using a risk based approach identifies otherwise, and this is accepted by the Service Manager). 2. Design the Annual LAMP, in accordance with the principles of the Employer's LAMMM. 3. Record and supply asset data and energy consumption data as defined in the Provider contract and the Asset Data Management Manual Provider Requirements. 4. Maintain the energy consumption inventory in accordance with BSCP 520.		

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Part 9

Paved Areas Maintenance Requirement

Version 1.3

Part 9 – Paved Areas Maintenance Requirement		
Scope: Paved areas, comprising: trafficked areas, hard shoulders, footways, cycle tracks, bridle ways, paved pedestrian areas, hard-standing paved areas, paved central reserves, traffic islands and cross-overs, covers, gratings, frames, boxes, kerbs, edgings and preformed channels which fall within the Area Network.		
Provider Outcomes: 1. The paved area provides a safe and even surface for all road users.	**Performance Metric:**	**Performance Requirement Level:**
Deliverables: 1. In accordance with the accepted Maintenance Requirements Plan, develop and implement a risk assessment methodology to determine the frequency of inspections appropriate to location, asset type and condition. Execute inspections to establish condition of paved areas.	Compliance with accepted MRP	100%
2. Warn road users of the condition of the highway in relation to defects that could cause danger to users of the highway.	Time taken to warn road users (from verification to implementation of warning; note whether preventative or re-active)	[No Performance Requirement Level set]
3. Make safe Defects.	Time taken to make safe Defects (from verification to restoration of safe operation; note may not be permanent repair)	[No Performance Requirement Level set]

continues

Deliverables:	Performance Metric:	Performance Requirement Level:
	Trafficked Areas and Hard Shoulders:	
	Pothole ≥ 20 mm depth and ≥ 100 mm diameter	[No Performance Requirement Level set]
	Pothole ≥ 150 mm diameter, or of ≥ depth than that of the surface course thickness, or of ≥ depth than 40mm.	Zero (within 24 hours of verification)
	Local Surface Deformation (When measured under a 2m straight edge)	
	Deformation ≥ 20 mm	[No Performance Requirement Level set]
	Deformation ≥ 40 mm	Zero (within 24 hours of verification)
	Ironwork	
	Difference in level around ironwork ≥ 25 mm	Zero (within 24 hours of verification)
	All other areas:	
	Pothole ≥ 20 mm depth and ≥ 100 mm diameter	[No Performance Requirement Level set]
	≥ 25 mm depth or ≥ 150 mm diameter	Zero (within 24 hours of verification)

continues

Deliverables:	**Performance Metric:**	**Performance Requirement Level:**
	All other areas:	
	Local Surface Deformation (When measured under a 2m straight edge)	
	Deformation ≥ 20mm	[No Performance Requirement Level set]
	Deformation ≥ 25 mm	Zero (within 24 hours of verification)
	Trip Hazard Any step change ≥ 25 mm	Zero (within 24 hours of verification)
Processes: *No Employer requirements; in accordance with the Quality Plan and Maintenance Requirements Plan the Provider is to design appropriate Processes to produce the Deliverables in order to achieve the Provider Outcomes.*	**Performance Metric:**	**Performance Requirement Level:**

Procedures: 1. Rectify Defects relating to asphalt or concrete carriageways in accordance with the MCHW, HD 31 or HD 32 respectively and the associated DMRB Volume. Note that this includes response to diesel spillage 2. Rectify Defects relating to asphalt or concrete Footways and Cycle Tracks in accordance with HD 39 or HD 40 respectively and the associated DMRB Volume. 3. Implement warnings of slippery conditions in accordance with HD 28. 4. Statutory Undertakers or licence holders who are governed by the New Roads and Street Works Act 1991 may execute minor repairs to paved areas. In the event that completed repairs are defective within the guarantee period (as defined in the Specification for the Reinstatement of Openings in Highways), inform the Undertaker of the Defects using the procedure contained in Chapter 4 of the Code of Practice for Inspections. If immediate risks are posed to persons, rectify Defects and recover costs from the Undertaker. 5. Record asset data using the appropriate system defined in the Provider Contract and the ADMM Provider Requirements.		

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Part 10

Road Markings and Road Studs Maintenance Requirement

Version 1.2

Part 10 – Road Markings and Road Studs Maintenance Requirement		
Scope: Road markings and road studs in all materials within the Area Network.		
Provider Outcomes: 1. Road markings and road studs are safe and visible.	**Performance Metric:**	**Performance Requirement Level:**
Deliverables: 1. Implement the Maintenance Requirements Plan (MRP) with regards to Road Markings and Road Studs Maintenance Requirements. 2. Manage deterioration of road markings and road studs such that they give effect to regulatory provision in the Traffic Signs Regulations and General Directions (TSRGD). 3. Inspect the road markings and road studs to obtain asset inventory and condition data; execute follow up inspections. 4. Correct or make safe all Category 1 Defects (as defined in TD 26).	Compliance with accepted MRP Compliance with TD 26 inspection frequencies Compliance with TD 26 requirements Time taken to make safe Defects (from notification or inspection to restoration of safe operation; note may not be permanent repair)	100% 100% 100% [No Performance Requirement Level set]
Processes: *No Employer requirements; in accordance with the Quality Plan and Maintenance Requirements Plan the Provider is to design appropriate Processes to produce the Deliverables in order to achieve the Provider Outcomes.*		

Procedures:	Performance Metric:	Performance Requirement Level:
1. Follow TD 26. 2. Record asset data as defined in the Provider contract and the Asset Data Management Manual Provider Requirements.		

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Part 11

Road Restraint Systems Maintenance Requirement

Version 1.2

Part 11 – Road Restraint Systems Maintenance Requirement		
Scope: All vehicle restraint systems and pedestrian restraint systems within the Area Network, including: vehicle safety barriers, crash cushions, terminals, transitions, pedestrian guard rails, vehicle parapets and pedestrian parapets on bridges and other structures.		
Provider Outcomes: 1. Road restraint systems are managed and maintained to function in accordance with their intended design and performance requirements.	**Performance Metric:**	**Performance Requirement Level:**
Deliverables: 1. Implement the Maintenance Requirements Plan (MRP) with regards to Road Restraint Systems Maintenance Requirements, and within manufacturer's inspection specifications for proprietary systems. This will obtain asset inventory and condition data and will identify Defects including, but not limited to: a. Areas of corrosion, cracking, spalling or other material deterioration which could affect achievement of the outcome; b. Broken, loose or missing components; c. Potential signs of fluid and gas build up in metal parapets. 2. Make safe Defects.	Compliance with accepted MRP Defects present, not relating to impact damage (no. of) For each assessed Defect, difference between suitable response path nominated by following risk assessment, and actual response taken Time taken to make safe Defects (from notification or inspection to restoration of safe operation; note may not be permanent repair)	100% [No Performance Requirement Level set] Zero [No Performance Requirement Level set]

continues

Deliverables:	**Performance Metric:**	**Performance Requirement Level:**
3. Maintain barrier tension in accordance with manufacturer's recommendations, or, in the absence of manufacturer's recommendations (e.g. on non-proprietary safety barrier systems), in accordance with BS 7669-3. Replace all post screws when re-tensioning Tension Corrugated Beam (TCB) safety barriers.		
Processes: *No Employer requirements; in accordance with the Quality Plan and Maintenance Requirements Plan the Provider is to design appropriate Processes to produce the Deliverables in order to achieve the Provider Outcomes.*		
Procedures: 1. Where Defects result from vehicle impact, follow the risk based procedure Lane Restrictions at Barrier Repairs (Appendix 11). 2. Rectify Defects in non-proprietary safety barrier systems in accordance with BS 7669-3. 3. Rectify Defects in proprietary road restraint systems in accordance with the manufacturer's recommendations.		

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Part 12

Road Traffic Signs Maintenance Requirement

Version 1.3

Part 12 – Road Traffic Signs Maintenance Requirement

Scope:

Traffic signs within the Area Network, including all posts, supports and fastenings; all bollards; mechanical variable message signs, together with associated electrical equipment where appropriate.

Out of Scope:

- The lighting of road traffic signs (which are included in Lighting Maintenance Requirements);
- Structural aspects of road traffic signs classified as structures in BD 63 (which are included in Structures Maintenance Requirements);
- Management of soft estate to preserve road users' visibility of road traffic signs (which is included in the Soft Estate Maintenance Requirements);
- Light emitting variable message signs (which are included in the Technology Management and Maintenance Manual); and,
- Proprietary Motorway Service Area signs.

Provider Outcomes:	Performance Metric:	Performance Requirement Level:
1. Road traffic signs are safe and clearly legible. 2. Road traffic signs give effect to regulatory provision.		
Deliverables:		
1. Implement the Maintenance Requirements Plan (MRP) with regards to Road Traffic Signs Maintenance Requirements.	Compliance with accepted MRP	100%
2. In accordance with TD 25, inspect road traffic signs to obtain asset inventory and condition data.	Inspection once per year.	100%
3. Manage identified Defects.	Number of Category 1 Defects (as defined in TD 25) present on the Area Network	Zero

continues

Deliverables:	**Performance Metric:**	**Performance Requirement Level:**
4. Identify manufacturing faults or Defects falling within a sign's warranty period and proactively pursue warranty claims on behalf of the Highways Agency. 5. Remove signs ceasing to have effect and which are obsolete. 6. Clean sign faces and reference numbers.	Compliance with TD 25 cleaning regimes	100%
Processes: *No Employer requirements; in accordance with the Quality Plan and Maintenance Requirements Plan the Provider is to design appropriate Processes to produce the Deliverables in order to achieve the Provider Outcomes.*		
Procedures: 1. Regulatory provision for Road Traffic Signs is given in the Traffic Signs Regulations and General Directions (TSRGD), and includes those specially authorised by the Secretary of State under Section 64 of the Road Traffic Regulation Act, signs ceasing to have effect as defined in Regulation 3, and those which are obsolete as defined in TD 25. 2. Manage identified Defects in accordance with TD 25. 3. Where repair or replacement of signs is required, execute this in accordance with TD 25. 4. Clean signs in accordance with TD 25 and manufacturers' instructions. 5. Record asset data as defined in the Provider contract and the Asset Data Management Manual Provider Requirements.		

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Part 13

Soft Estate Maintenance Requirement

Version 1.4

Part 13 – Soft Estate Maintenance Requirements		
Scope: The semi-natural, improved / semi-improved and landscaped parts within the Area Network, including biodiversity, cultural heritage assets and hard landscaping areas.		
Provider Outcomes: 1. Soft estate condition is managed and maintained to minimise risks to road users, road workers and adjacent affected parties. 2. Soft estate is managed and maintained to protect and maintain protected designated and Protected Habitats / Species, improved / semi-improved / landscaped parts. 3. Soft estate is managed and maintained to meet existing commitments to Public Inquiries, Planning Consents, third parties, protection of Designated Sites (International, National), or Protected Habitats / Species. 4. Soft estate is managed and maintained not at the detriment of its aesthetic value. 5. Soft estate is managed and maintained within the wider landscape to maximise the Area Networks potential to link and enhance habitats.	**Performance Metric:**	**Performance Requirement Level:**
Deliverables: 1. Develop and annually update Environmental Management Plan (EMP) and submit to the Service Manager for acceptance. 2. Implement the Maintenance Requirements Plan (MRP) with regards to Soft Estate Maintenance Requirements. *continues*	Compliance with accepted EMP Compliance with accepted MRP	100% 100%

Deliverables:	Performance Metric:	Performance Requirement Level:
3. Maintain and preserve road users' sight lines and stopping distance, this includes but not limited to junctions, access points, curves, bends and central reserve.		
4. Maintain and preserve road users' visibility of road traffic signs and signals.		
5. Ensure illumination / lumination from lighting is not obscured.		
6. Preserve CCTV camera operational visibility splays.		
7. Maintain soft estate to minimise risk of fire hazards.		
8. Maintain soft estate by removing obstructions that prevent safe access, inspection and maintenance of technology equipment. This includes but not limited to roadside equipment cabinets and cable joint chambers, cable troughs, CCTV camera sites, message sign sites, metrological equipment.	Number of validated claims relating to soft estate not maintained in accordance with Deliverables 1 to 19	Zero
9. Maintain soft estate by removing obstructions that prevent use of customer facilities. This includes but not limited to emergency roadside telephones and emergency refuge areas.		
10. Maintain soft estate by removing obstructions that prevent safe access to and use of footways, footpaths, cycle tracks, bridle ways and paved pedestrian areas. This includes but is not limited to the removal of vegetation and weeds.	Compliance with Deliverables 1 to 19 will be verified by sample audits, as specified by the Service Manager	100%
11. Minimise the risk of trees or vegetation falling on the Area Network that could represent safety risk, obstruction or nuisance. This includes but is not limited to trafficked or pedestrian areas.		
12. Manage the soft estate to control the spread or increase of instances of Injurious, Invasive Non-Native Species.		
13. Manage and maintain soft estate to minimise the risk of adversely affecting the stability, integrity or operation of other highway assets.		
continues		

Deliverables:	**Performance Metric:**	**Performance Requirement Level:**
14. Manage soft estate to meet existing landscape, amenity, screening functions and/or other commitments where these have been raised by existing Public Inquiries, Planning Consents, Protected Habitats / Species or Designated Sites (International, National). 15. Maintain and update knowledge of semi-natural assets, improved / semi-improved, landscaped, Protected Habitats / Species present or likely to be present within the soft estate. 16 Manage and maintain soft estate to ensure that an amenity strip from each edge of the carriageway remains unobstructed by vegetation throughout the year. 17. Manage and maintain habitats and species within the Soft Estate. 18. Manage and maintain Invertebrate friendly grasslands. 19 Manage and maintain Nature Improvement Areas.		
Processes: 1. Define the execution of EMP and MRP outputs in the management and maintenance of the soft estate to provide a strip (minimum 2 metre width) from each edge of carriageway, so that it remains unobstructed by vegetation through the undertaking of amenity cuts twice a year. Amenity cuts should be timed as to minimise the height and density of vegetation within the 2m strip throughout the year. Approval for amenity cuts that vary from the requirement will be managed by the departures process. 2. Define the execution of managing and maintaining the soft estate to ensure vegetation is removed from the central reserve.		

Procedures:	**Performance Metric:**	**Performance Requirement Level:**
1. Record asset data using the appropriate system defined in the Provider contract and the Asset Data Management Manual Provider Requirements. 2. Develop the EMP in accordance with HA 108 and the Highways Agency Environment Strategy and Managing our Approach to Environmental Performance. 3. Manage and maintain the soft estate in accordance with IAN 172/13		

Soft Estate Maintenance Requirement - Hold Point		
No.	Hold Point	Release Mechanism
1.	The Provider must prepare the Environmental Management Plan in accordance with HA 108 and the Highways Agency Environment Strategy and Managing our Approach to Environmental Performance and submit to the Service Manager.	Written acceptance of the Environmental Management Plan by the Service Manager.

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Part 14

Structures Maintenance Requirement

Version 1.3

Part 14 – Structures Maintenance Requirement

Scope:

A civil construction within the Area Network, situated under, over or adjacent to the Strategic Road Network.

Structures include, but are not limited to:

- Overbridges;
- Underbridges of enclosed length less than 150m;
- Subways of enclosed length less than 150m;
- Footbridges;
- Cycle bridges;
- Retaining Walls;
- Culverts with a clear span or internal diameter greater than 0.9m;
- Buildings;
- Structural maintenance of fences, walls, screens and environmental barriers >3m in height;
- Gantries, signs, lighting columns or catenaries, CCTV masts, classified as structures in BD 63.

Non-structural elements also included within the scope of this maintenance requirement include, but are not limited to:

- Cross carriageway ducts, ducts through structures, technology equipment cabinets and all ancillary equipment (e.g. hoists, winches, covers).

Out of Scope:

- Transmission stations

Provider Outcomes:	Performance Metric:	Performance Requirement Level:
1. Structures and their constituent parts are managed and maintained to minimise risks to road users.		

Deliverables:	**Performance Metric:**	**Performance Requirement Level:**
1. Implement the Maintenance Requirements Plan (MRP) with regards to Structures Maintenance Requirements.	Compliance with accepted MRP	100%
2. Execute Principal Inspections.	No. of structures inspected as per BD 63 frequencies	100%
3. Execute General Inspections.	No. of structures inspected as per BD 63 frequencies	100%
4. Identify where a need for Special Inspections exists; notify the Service Manager. Upon Service Manager acceptance, execute Special Inspections.		
5. Make safe Defects.	Time taken to make safe Defects (from notification or inspection to restoration of safe operation; note may not be permanent repair)	[No Performance Requirement Level set]
6. Review and update interim measures for the management of substandard structures.		
Processes: *No Employer requirements; in accordance with the Quality Plan and Maintenance Requirements Plan the Provider is to design appropriate Processes to produce the Deliverables in order to achieve the Provider Outcomes.*		
Procedures: 1. Execute Principal Inspections in accordance with BD 63. 2. Execute General Inspections and Special Inspections in accordance with BD 63.		

continues

Procedures:	**Performance Metric:**	**Performance Requirement Level:**
3. Manage sub-standard structures in accordance with BD 79. 4. Undertake maintenance in accordance with appropriate Parts of Volume 3 of the DMRB, manufacturers' instructions, and the relevant Structures Maintenance Manual or Structures File. 5. Record asset data as defined in the Provider contract and the Asset Data Management Manual Provider Requirements.		

Structures Maintenance Requirement - Hold Point		
No.	Hold Point	Release Mechanism
1.	Where a need for Special Inspections exists, notify the Service Manager.	Evidence held by the Service Manager that he has accepted execution of Special Inspections.

Part 15

Sweeping and Cleaning Maintenance Requirement

Version 1.4

Part 15 – Sweeping and Cleaning Maintenance Requirement

Scope:

Sweeping and cleaning of:

- All motorways and their surrounds within the Area Network;
- APTRs and their surrounds within the Area Network **only** when listed in tables 15.1 or 15.2 in the Appendix to this requirement.
- ATPR and their surrounds through agreement with the local authority.

Cleaning and servicing of amenity facilities within the Area Network.

Graffiti within the Area Network.

Emptying of litter bins within the Area Network.

The management of animal fatalities within the Area Network.

Out of Scope:

- Initial response to Incidents involving or giving rise to debris, detritus or animal carcasses (see Incident Response requirements).
- Sweeping and cleaning of APTRs and their surrounds **not** listed in tables 15.1 or 15.2 in the Appendix to this requirement, or where no local authority agreement exists.

Provider Outcomes:	Performance Metric:	Performance Requirement Level:
1. The Area Network is predominantly free from litter, refuse and detritus and fly tipping. 2. Amenity facilities are safe and serviceable. 3. The functionality of the Area Network is not impeded by litter, debris, refuse, detritus, fly tipping or animal carcasses. *continues*		

Provider Outcomes:	**Performance Metric:**	**Performance Requirement Level:**
4. All graffiti is managed to ensure that the adverse impact on our customers experience of the Area Network is minimised. 5. Remove, identify, store and seek to inform owners of animal fatalities discovered within the Area Network.		
Deliverables:		
1. Implement the Maintenance Requirements Plan (MRP) with regards to Sweeping and Cleaning Maintenance Requirements.	Compliance with accepted MRP	100%
2. Implement a risk based sweeping and cleaning intervention regime to mitigate adverse affects of litter, fly-tipping, refuse, or detritus on the appearance, stability, integrity or operation of highway assets.		
3. Implement a risk based sweeping and cleaning intervention regime to mitigate adverse affects of debris, bird droppings and animal carcasses on the stability, integrity or operation of highway assets.		
4. Remove from sight all graffiti within the Area Network and its surrounds.	Within 24 hours for offensive graffiti. Within 21 days for non-offensive graffiti.	100% 100%
5. Maintain Paved Areas (Carriageway, paved verges and paved central reservations of motorways and APTRs) to grade A as defined in the Code of Practice on Litter and Refuse.	Restore to grade A from grade B or C as defined in the Code of Practice on Litter and Refuse within 28 days	100%
	Restore to grade A from grade D as defined in the Code of Practice on Litter and Refuse within 7 days	100%

continues

Deliverables:	Performance Metric:	Performance Requirement Level:
6. Maintain Paved Areas (motorway and APTR roundabouts and lay-bys, approach and slip roads) to grade A as defined in the Code of Practice on Litter and Refuse.	Restore to grade A from grade B or C as defined in the Code of Practice on Litter and Refuse within 14 days	100%
	Restore to grade A from grade D as defined in the Code of Practice on Litter and Refuse within 7 days	100%
7. Maintain all other parts of the Area Network (non paved) to grade B as defined in the Code of Practice on Litter and Refuse.	Restore to grade B from grade C as defined in the Code of Practice on Litter and Refuse within 28 days	100%
	Restore to grade B from grade D as defined in the Code of Practice on Litter and Refuse within 7 days	100%
8. Implement a risk based intervention regime to manage, maintain and clean amenity facilities.		
9. Directly notify other Highway Authorities responsible for sweeping and cleaning on APTRs not listed in tables 15.1 or 15.2 in the Appendix to these requirements, where it is apparent that they are not maintaining their sections of the Area Network to an acceptable grade of cleanliness.		
10. Deploy a Sweeping and Cleaning Rapid Response when instructed by the Service Manager.	Within 24 hours of notification	100%
11. Empty litter bins prior to them over spilling.		
12. Identify, inspect and clear any incidence of fly-tipping.		
13. Providers must manage, recover, identify, record, store, inform and dispose of animal fatalities discovered within the Area Network.	Recover animal fatalities within 24hours of notification	100%

continues

Deliverables:	**Performance Metric:**	**Performance Requirement Level:**
14. Providers must seek to identify and inform the owner of any domesticated animal fatality, including and not limited to utilising; collar/tags, ear tattoos and by scanning for microchips. Owners must be given opportunity to their collect animal/pet remains from the storage depot. 15. All canine fatalities must be reported to the local authority Dog Warden and/or Police. In situations where no positive identification can be made of a canine fatality, a description must be provided. 16. All animals, where appropriate, must be placed in cold storage prior to disposal. In instances of unidentified canine fatalities, following notification to the Dog Warden and/or Police, if the owner does not come forward within a seven-day period the remains can be deposed of. 17. All animal fatalities must be recorded, including but not limited to date, animal type and location, and any trends must be report to the Service Manager.	Complete animal fatality identification within 7 days of notification.	100%
Processes: 1. Animal fatalities must be recovered separately from other litter, debris, refuse, detritus or fly tipping.		
Procedures 1. Develop the MRP to manage sweeping and cleaning to comply with the standards of cleanliness given in the Code of Practice on Litter and Refuse (Defra, 2006). 2. Assess Area Network acceptable grade of cleanliness as described in the Code of Practice on Litter and Refuse. *continues*		

Procedures:	**Performance Metric:**	**Performance Requirement Level:**
3. Where Sweeping and Cleaning Rapid Response is requested by the Service Manager it will apply to a specific area. The Sweeping and Cleaning Rapid Response will incorporate all sweeping, cleaning, fly-tipping or litter picking required to restore the area to A grade cleanliness for Paved Areas, and B grade cleanliness for all other parts of the Area Network (as described in the Code of Practice on Litter and Refuse). Note that Sweeping and Cleaning Rapid Response includes removal of all graffiti where that falls within the specified area. 4. Animal fatalities involving, farm stock, wild animals or game animals, must be managed in accordance with guidance provided by the Department for the Environment, Food & Rural Affairs and the Animal and Plant Health Agency.5. Establish and execute measures to manage any incidence of fly-tipping on the network so that it is removed. Report details of fly-tipping incidents to the Service Manager to enable action to be taken against offenders. 5. Establish and execute measures to manage any occurrence of fly-tipping on the network so that it is removed. Report details of fly-tipping occurrences to the Service Manager to enable action to be taken against offenders.		

Part 16

Tunnels Maintenance Requirement

Version 1.1

Part 16 – Tunnels Maintenance Requirement

Scope:

Tunnels within the Area Network, including associated mechanical and electrical equipment, and Supervisory Control And Data Acquisition (SCADA) systems.

A highway tunnel is defined as any subsurface highway structure enclosed for a length of 150m or more, including associated access and service infrastructure. The Operation and Maintenance Manual and the Network Information must be consulted to further define the scope of responsibilities for each tunnel.

Out of Scope:

Technology equipment as defined in the scope of the Technology Management and Maintenance Manual is the responsibility of the Regional Technology Maintenance Contractor (RTMC).

Provider Outcomes:	Performance Metric:	Performance Requirement Level:
1. Tunnels are managed, maintained and operated to ensure that they are safe and structurally sound.		

Deliverables:	**Performance Metric:**	**Performance Requirement Level:**
1. Implement the Maintenance Requirements Plan (MRP) with regards to Tunnels Maintenance Requirements.	Compliance with accepted MRP	100%
2. Operate and maintain the tunnel in accordance with the Operation and Maintenance Manual (O&MM).	Compliance with O&MM	100%
3. Review and update the tunnel's O&MM to include specific requirements for the operation, emergency response, service activities, and to identify safety critical components and ensure that these specifically operate as intended. Ensure O&MM revisions and updates include operational risk assessments which will determine the minimum safe operational requirements and associated minimum intervention times when Defects are identified. Update the O&MM following a serious or disruptive Incident.		
4. Execute Principal Inspections.		
5. Execute General Inspections.		
6. Make safe Defects which pose a hazard to road users.	Time taken to make safe Defects (from notification or inspection to restoration of safe operation; note may not be permanent repair)	[No Performance Requirement Level set]
7. Manage tunnel surfaces to maintain light reflectance, and avoid accumulation of toxic, corrosive and flammable deposits.		
8. Conduct electrical inspection and testing.		
Processes: *No Employer requirements; in accordance with the Quality Plan and Maintenance Requirements Plan the Provider is to design appropriate Processes to produce the Deliverables in order to achieve the Provider Outcomes.*		

Procedures:	Performance Metric:	Performance Requirement Level:
1. Inspect tunnels in accordance with BD 53. 2. Manage, maintain and operate tunnels in accordance with BA 72 and BD 78. 3. Manage pollutant levels within the tunnel in accordance with exposure limits set out in the O&MM and BD 78. Note that exposure limits for oxides of nitrogen (NOx) given in BD 78 are no longer applicable following withdrawal by HSE of mandatory exposure limits relating to this pollutant. Instead, there is a requirement to control exposure. 4. Comply with the Road Tunnels Safety Regulations 2007 in addition to BD 53 where they apply (i.e. to tunnels over 500m in length and which form part of the Trans-European Road Network). 5. Record tunnels asset data in accordance with the appropriate system defined in the Provider contract and the Asset Data Management Manual Provider Requirements. 6. Conduct electrical inspection and testing in accordance with BS 7671 – Requirements for Electrical Installations.		

Tunnels Maintenance Requirement - Hold Points		
No.	Hold Point	Release Mechanism
1.	The Provider must review and update the Operation and Maintenance Manual for each tunnel in the Area Network in accordance with the Tunnels Maintenance Requirements within 6 months of the Access Date, and submit this to the Service Manager.	Written acceptance of each Operation and Maintenance Manual by the Service Manager.
2.	The Provider must review and update the Operation and Maintenance Manual for each tunnel in the Area Network in accordance with the Tunnels Maintenance Requirements within 6 months of the date that the Provider Contract ends, and submit this to the Service Manager.	Written acceptance of each Operation and Maintenance Manual by the Service Manager.
3.	Where a need for a Special Inspection exists the Provider must notify the Service Manager.	Written instruction from Service Manager for the Special Inspection.

Appendix 2

Managing Network Occupancy Operational Requirement

Version 1.3

Appendix 2.1 – Intelligence Led Approach to MNO

Safe and effective network operation necessitates an intelligence-led approach in order to mitigate risks to Area Network availability whilst targeting delivery towards reducing risk exposure to road workers and reducing cost.
The approach to selecting suitable time periods for Occupancies must account for the Additional Delay above that typically expected on a given route at a given time. This acknowledges that levels of delay will vary with time across different parts of the Area Network according to demand. Area Network conditions must remain reliable within acceptable Additional Delays.

This intelligence-led approach is required to ensure decisions are made about where and when to undertake each Occupancy, accounting for the likely adverse impacts on road users, safety of road workers and in determining Lowest Cost Practical Options (LCPOs) whilst maintaining the requirement to ensure conflicts with other Occupancies and Activities are managed appropriately.

The LCPO approach to network Occupancy should start from the lowest road worker risk exposure and lowest cost and then consider whether traffic management arrangements are likely to introduce impacts which are disproportionate to the scale of anticipated savings. The key consideration is whether an Occupancy can be undertaken on the Area Network without creating unacceptable Additional Delay.

An LCPO design is one which ensures:

(i) That requirements are maintained for the Occupancy that minimises risk to those working within it.
(ii) Additional Delay is kept within acceptable levels for the categorisation of route Area Network.
(iii) Additional Delay is kept within acceptable levels on diversion routes on the SRN.
(iv) Additional delay is kept within acceptable levels on Local Highway Authority networks (as agreed with relevant Local Highway Authorities)
(v) Compliance with all Highways Agency requirements in relation to all roadworks embargoes including public and bank holidays and local operating regimes for Smart Motorways. In doing so, the potential for adverse publicity from activities where traffic management has to remain must be balanced against the road worker risk exposure and the benefit gained from undertaking Occupancies for the minimum duration at the most appropriate time commensurate with cost. Any specific local requirements will be instructed by the Service Manager.
(vi) The cost in relation to LCPO must address all design, construction and future maintenance costs together with delay costs to the road user.

There are many locations/times on the Area Network which typically exhibit delays. Occupancies can be considered during these periods, provided that the maximum Additional Delay introduced by traffic management does not exceed the acceptable level and providing that the temporary traffic management arrangements proposed are appropriate for the traffic conditions. Individual departures to the acceptable level will be considered by the Service Manager. These departures must be submitted using the Approval of departure form at Appendix 2.5.

Appendix 2.2 – Challenge to Individual Provisional Bookings

1 The Provider must be aware that there will be times when Occupancies should not take place on the Area Network. This must include adhering to all instructions relating to Area Network Occupancy restrictions issued by the Service Manager.

2 Any departure from this requires the specific approval from;

- Service Delivery Team Leader and/or
- the Service Manager and/or
- the Regional Operations Board (ROB) where the impact of the Occupancy on the Strategic Road Network is considered as likely to be significant by the Service Manager.

3 Where reductions in speed limits are proposed then the guidance contained in Chapter 8 of the Traffic Signs Manual must be followed. Where a reduction to the existing speed limit is greater than the recommended 20mph reduction then this must be approved as above.

4 For any approval required in points 2 or 3 above the Provider must complete the Approval of departure form included at Appendix 2.5. The completed form must be submitted to the Service Manager for consideration and approval as appropriate.

5 The Provider must ensure that unacceptable Additional Delay is not caused by Occupancies that affect traffic management considerations in relation to Planned Events.

6 A list of Occupancy embargoes may be provided by the Highways Agency but if not must be provided by the Provider and needs to be accepted by the Highways Agency. In addition this must include all instances where the Highways Agency has issued specific instructions about restricted Occupancy requirements.

7 The Provider must ensure that all provisional bookings have been challenged to establish whether they are covered by 1, 2, 3, 5 and 6 above and must notify the Occupancy or Activity promoter of any approved departure accordingly.

8 The Provider must make every endeavour to coordinate Occupancies/Activities on the Area Network. This will require local considerations to be addressed. Where agreement is not reached the Provider must escalate the issue as follows:

a. Stage 1 Escalation – The Service Delivery Team Leader determines prioritisation where the impact of that decision is isolated to within the Area Network.
b. Stage 2 Escalation – The Service Manager determines prioritisation where the impact of that decision is isolated to within the Region.
c. Stage 3 Escalation - The ROB determines prioritisation where the impact of that decision is cross-regional.

9 The Provider must undertake an initial challenge to provisional booking. The Provider must satisfy itself that:

a. The JTR Toolkit has been utilised where appropriate.
b. The proposed Occupancy has been subject to challenge in respect to its impact on delay utilising Highways Agency modelling tools as instructed by the Service Manager. However, caution must be applied to ensure that the chosen modelling approach accounts for varying delays on the network for the relevant time of the day, rather than considering an average delay which risks significantly underestimating the additional journey time that would be experienced at peak times.
c. The proposed duration appears reasonable when considering work outputs.

10 Where agreement cannot be reached between the Provider and the promoter over issues arising from the initial challenge in 9 above, then the Provider must escalate the issue as follows:

a. Stage 1 Escalation – The Service Delivery Team Leader determines prioritisation where the impact of that decision is isolated to within the Area Network.
b. Stage 2 Escalation – The Service Manager determines prioritisation where the impact of that decision is isolated to within the Region.
c. Stage 3 Escalation – The ROB determines prioritisation where the impact of that decision is cross-regional.

Challenges to firm Occupancy bookings are covered in Appendix 2.3.

The Provider must also have regard to Appendix 2.3 when challenging individual provisional bookings to ensure that the overall programme of Area Network Occupancies is considered.

Appendix 2.3 – Challenge to Individual Firm Bookings

This challenge procedure is a significant element of delivering the MNO outcome to minimise the adverse impact of Occupancies/Activities on road users of the Area Network. The Provider must use its engineering expertise and historic data to challenge the method, timing and duration of all planned firm Occupancies.

The degree of intensity of this challenge will vary in relation to the nature of the Occupancy requirement, but will always:

- Check that the JTR Toolkit has been utilised where appropriate in arriving at the proposed Occupancy requirement.
- Check that the estimated Additional Delay is acceptable using appropriate Highways Agency modelling tools as instructed by the Service Manager.
- Check the proposed method of work (from an engineering perspective, that it recognises the MNO Provider Outcome in respect of minimising the adverse impact of Occupancies on road users of the Area Network).
- Check the timing of the work; is it being done at the most efficient time of day/month/year, considering all other activity bookings, commensurate with cost, including the use of all legislative powers available under the contract.
- Take advantage of sharing opportunities (including with other Occupancy or Activity promoters).
- Use expertise and historic performance data as a basis to ensure that the LCPO approach has delivered appropriate duration.
- Ensure contingency plans are in place for potential changes to circumstances during Occupancy e.g. curtailment, adjustment or abandonment of work.

The Provider must also have regard to Appendices 2.2 & 2.4 when challenging individual firm bookings.

Appendix 2.4 – Optimisation of Occupancy

Optimisation means the shortest duration at most appropriate time for any Occupancy or group of Occupancies. To maximise safety this must be balanced against the lowest practicable number of Occupancies required in order to minimise the number of traffic management installations and removals.

Optimisation essentially commences with the challenges to provisional and firm booking requirements covered in Appendices 2.2 and 2.3. However this procedure covers the optimisation of the overall programme of Occupancies. It is an iterative process and the Provider must keep the overall programme of Occupancies under review at all times. The Provider must continually challenge and optimise the planned programme of Occupancies by some or all of the following as applicable:

Table 2.4.1 Optimise Occupancies

Action	**Description**
Adjust timing of single Occupancy.	Move Occupancy in terms of time of day/week/month to a more appropriate (LCPO) time.
Adjust timing of multiple Occupancies.	To increase or decrease separation/proximity between Occupancies.
Combine Occupancies.	From both within the Provider and with third parties.
Further challenge to configuration and/or duration.	Re-visit the challenge requirements covered by Appendix 2.3 - Challenge to Firm Bookings.
Suspension of Occupancy.	Suspend the Occupancy for re-booking at a more appropriate (LCPO) time.

This list is not exhaustive and the Provider must look to innovate and establish new tools and techniques to optimise all Occupancies. In doing so the Provider must contribute any such new and innovative ideas into the JTR Toolkit.

Appendix 2.5 - Managing Network Occupancy – Approval of departure form

This form is to be used where approval is required for departures to Occupancy requirements in accordance with Appendices 2.1, 2.2, 2.3 and 2.4 above

OCCUPANCY DETAILS			
SRW Closure No.			
Service Delivery Team	Select from list		
Project/Scheme (including PIN) *Brief description (to include type of work and what category in line with SRW)*			
Location *Brief details of location (to include junctions roundabouts and slip roads)*			
Direction	*Northbound* *Eastbound*		*Southbound* *Westbound*
Road standard and category	*Carriageway* *Select from list*	*Number of lanes* *Select from list*	*Road category* *Select from list*
Duration and timing *Estimated timing and duration of works*			
IMPACT OF PROPOSED TM ARRANGEMENTS			
Traffic management arrangements *Brief description of proposed lane closures and restrictions, scheme length and timing and duration (if different to above).*			
Is the traffic management a full closure?	Select from list		
Does the traffic management create Additional Delay? *If yes, specify max delay (ie additional minutes queuing time) and time period*	Select from list		
Does the traffic management create unacceptable Additional Delay? *If yes, specify max RAG status and time period*	Select from list		
Are there any potential occupancy conflicts? *If yes, provide explanation*	Select from list		
Are there any safety Departures required?			

If yes, please specify	
Will traffic management be on over bank holiday or during an embargo? *If yes, please specify*	
ASSESSMENT OF LOWEST COST PRACTICAL OPTION (LCPO)	
Is this the LCPO for the Scheme?	Select from list
If yes and LCPO causes unacceptable delay, are alternative traffic management options available at no extra cost? *Please specify impact of TM and explain why this has been discounted*	Select from list
If no, why has a departure from LCPO requirements been requested? *Please provide brief details, include explanation of why exceptions required. Include ratio of cost vs benefit to LCPO*	

Approval

Submitted by (Service Provider)	Signature	Name Date	
Checked by (HA Service Delivery Team Manager)	Signature	Name Date	
Approved (Service Manager)	Signature	Name Date	
ROB Approval	Signature	Name Date	

Appendix 2.6 – Risk Identification and Categorisation of Planned Events

1. Review all Planned Events in relation to their potential to have an adverse impact on road users of the Area Network.
2. Assess Planned Events against the following risk criteria in terms of the potential impact and likelihood to cause an adverse effect – review by High, Medium and Low risk potential utilising the current Risk Categorisation Matrix available from the Service Manager.

Table 2.6.1

Table 2.6.1
Group 1
Impact of traffic management arrangements (including promoter designed) Degree to which traffic management arrangements will adversely impact road users of the Area Network.
Severity of potential queuing delay Based on review of traffic flow in conjunction with access arrangements.
Combination effect with other concurrent Planned Events Extent to which the effect of other concurrent Planned Events could adversely affect the Planned Event under scrutiny.
Potential for other external situations to adversely affect the impact of the Planned Event Consideration of past experience/hot spots and the Provider using local knowledge of the Area Network. The assessment of this risk must be evidenced by historical data.
Smart Motorway(s) Planned Events which may have an adverse impact on the effective operation of any affected Smart Motorway(s) within the Area or in any adjacent Area.
Group 2
Location/proximity to Area Network The nature of the location of the Planned Event and/or its proximity to the Area Network.
Mode of access Extent of private vehicle usage against alternatives (e.g. public transport/park and ride).
Season Potential effects of severe weather.
Attendee profile Including geographical profile of attendees and characteristics of attendance e.g. numbers, short term visits, constant attendance.
Maturity of Planned Event and/or experience of Planned Event promoter Extent to which past experience of managing the impact of the Planned Event will affect the risk of impacting road users of the Area Network.
Quality of access conditions to Planned Event Degree to which the access/egress conditions could affect risk of impacting road users of the Area Network.

Potential for Planned Event characteristics to change during Planned Event Potential for changes to timing of Planned Event or access/egress assumptions.
Planned Events with cross area/regional impact Knowledge of cross area/regional impact and the potential for the same if other external situations occur.

3. Based on a review of these impact criteria, the Provider must categorise Planned Events using the Risk Categorisation Matrix. An example of the Risk Categorisation Matrix is shown in Table 2.6.2.

Table 2.6.2 Planned Events Risk Categorisation Matrix

Asset Maintenance and Operational Requirements Managing Network Occupancy Risk Categorisation Matrix				
Planned Event Title:				
Planned Event Reference Number:				
Risk Criteria	**Owner**	**Please Select**		
		Impact	Likelihood	Category
Group 1				
Impact of TM arrangements (including promoter designed)		Please Select	Please Select	
Severity of potential queuing delay		Please Select	Please Select	
Combination effect with other concurrent events		Please Select	Please Select	
Potential for other external intervening situation to adversely affect Planned Event		Please Select	Please Select	
SMART motorways		Please Select	Please Select	
Group 2				
Location / proximity to network		Please Select	Please Select	
Mode of access		Please Select	Please Select	
Season		Please Select	Please Select	
Attendee profile		Please Select	Please Select	
Maturity of Planned Event/promoter		Please Select	Please Select	
Quality of access conditions to Planned Event		Please Select	Please Select	
Potential for Planned Event characteristics to change during Planned Event		Please Select	Please Select	
Planned Events with cross Area/Regional impact		Please Select	Please Select	
		Overall Risk Category		

Run

Reset

4. Obtain input to categorisation from the EPO, the Service Manager and the RCC and also obtain acceptance of categorisation by the EPO.

5. Update monthly including re-categorisation as required.

6. All Risk Categorisation Matrices must be retained by the Provider.

The categorisation of risk for a Planned Event accounts for the potential of the Planned Event impacting adversely on road users of the Area Network. This enables the Highways Agency to determine those Planned Events with the biggest potential of causing an adverse impact and therefore requiring the greatest level of management input.

The original categorisation of the Planned Event will remain irrespective of any subsequent mitigation measures identified and implemented by the Provider.

If the Provider or the EPO become aware of any other risk particular to an Planned Event that could increase the categorisation of risk of that Planned Event then that increased categorisation must be applied.

Appendix 2.7 Abnormal Load Routeing and Management

General

The routeing of Abnormal Indivisible Loads on the Network is managed by the Highways Agency's Abnormal Indivisible Loads (AIL) Team. Abnormal Indivisible Loads are those which cannot, without undue expense or damage, be divided into two or more loads for the purpose of carriage on the Network. The movement of these loads is governed by Regulations, including the Road Traffic Act 1988, and DMRB standards BD86 and BD21. Associated policy mandated by that document is included in this Appendix.

BD86 gives guidance for the determination for Vehicle Ratings and Reserve Factors for highway bridges and structures that indicate the load carrying capacity of structures to support Special Type General Order (STGO) and Special Order (SO) vehicles. BD86 is used in conjunction with BD21 which refers to the Authorised Weight (AW) Regulations, and should be utilised for the routeing of abnormal or indivisible loads on the Network.

The categorisation of road vehicles is included in BD86 but they have been reproduced here for ease of reference:

(a) Vehicles complying with The Road Vehicles Construction and Use (C&U) Regulations and Authorised Weight (AW) Regulations.

This group includes cars, light goods vehicles, and rigid and articulated heavy goods vehicles up to a gross weight of 44 tonnes. These vehicles are covered by the C&U and AW Regulations and are not subject to permit and notification requirements. The effects of these vehicles are assessed in accordance with BD21.

(b) Vehicles complying with The Road Vehicles (Authorisation of Special Types) General Order (STGO Regulations).

This group includes vehicles that do not comply with the AW Regulations such as those used for the carrying or drawing of abnormal indivisible loads. Notifications of movements of these vehicles are required in accordance with STGO Regulations. The effect of these STGO vehicles must be assessed in accordance with BD86.

(c) Special Order (SO) Regulations.

This group includes vehicles that do not comply with the AW or STGO Regulations and is covered by Section 44 of the 1988 Road Traffic Act.

Abnormal Indivisible Load Special Order Process

There are three stages to the process as follows:

- Stage 1: SO Consultation Stage – BE 16 Application Approval
- Stage 2: 5 Day Notification Stage
- Stage 3: SO 60 Minute Notification Stage

Process flow charts detailing the roles each of the stakeholders, including Providers, discharges for Stage 1 to 3 are included at Tables 2.7.4 to 2.7.6 respectively.

The roles of the Provider, which he must assume and discharge, are further explained in Tables 2.7.1, 2.7.2 and 2.7.3.

Table 2.7.1 – Stage 1: SO Consultation Stage – BE 16 Application Approval:

Process Stage	Role	Responsibility	Timescale
Stage 1: SO Consultation Stage BE 16 Application Approval	To receive provisional SO route information from AIL Team via electronic AIL postbox.	Provider must have a predetermined electronic AIL postbox in operation to allow the receipt and passing of SO information to the AIL Team.	6 weeks
	To assess provisional load against structural capacity along the proposed SO route.	Provider must undertake structural capacity assessment along the proposed SO route in accordance with BD86 or as otherwise agreed with the Highways Agency Technical Approval Authority (TAA).	
	To provide the AIL Team with comments on any potential road space booking or network Occupancy conflicts.	Provider must assess the provisional SO route and timeframe using Scheduled Roadworks (SRW) as well as any other available source of network information.	
	To return all comments following structural assessment and Occupancy checks to the AIL Team.	Structural assessments and Occupancy checks must be completed by the Provider within timescales prescribed by the AIL Team. All comments must be returned (including nil returns) to the AIL Team by e-mail.	
	Identify any need for detailed structural assessment or Technical Approvals	Provider must: Inform the AIL Team of the requirement for additional technical approval at the soonest opportunity; provide information as to type of assessment or approval required as well as approximate timescale implications, and; administer detailed assessments or Technical Approvals on behalf of the haulier in accordance with existing procedures.	Up to 10 weeks*
	Provide any further assistance or information as requested by AIL Team	Provider must respond to requests as soon as reasonably practicable and must provide any assistance according to AIL Team request	Task dependant
	Take receipt and file all approved SO permit and route information	Provider must receive SO permit and route information via electronic AIL postbox and must file all information in accordance with existing procedures to facilitate future reference.	2 days*

* timescales will vary

Table 2.7.2 - Stage 2: 5 Day Notification Stage

Process Stage	Role	Responsibility
5 Day Notification Stage	Should a Provider receive a **5 Day Notification Stage** directly from a haulier they are to advise the National Traffic Control Centre (NTCC) at their soonest possible opportunity	The Providers must provide the NTCC with all haulier 5 Day Notification information.
	To receive 5 Day Notifications from NTCC via electronic AIL postbox.	Provider must have a predetermined electronic AIL postbox in operation to allow the receipt and passing of SO information to the NTCC.
	To review current structural capacity along the approved SO route	Provider must undertake structural capacity review along the approved SO route. Load capacity assessments of structures for proposed SO vehicle movements must be subject to Technical Approval procedures in accordance with BD2.
	To return all comments following structural assessment to the NTCC.	Provider must complete structural assessments checks within timescales prescribed by the NTCC and must return all relevant comments (including nil returns) to the NTCC by e-mail
	To provide the NTCC with comments on any road space booking or network Occupancy conflicts	Provider must review the approved SO route and timing against current Scheduled Roadworks (SRW) entries as well as any other available source of network information. The Provider must also complete road space Occupancy checks within timescales prescribed by the NTCC and must return all relevant comments (including nil returns) to the NTCC by e-mail.
	To create an SO movement related Event (X) entry in SRW	Provider must include all relevant SO movement details to SRW . The HA SO permit number must be entered into a SRW field that can be viewed by the NTCC for referencing purposes. Any ongoing management and update of SO SRW entries must be done in accordance to existing procedures.
	Provide any further assistance or information as requested by the Area Performance Team (APT).	Provider must respond to requests as soon as reasonably practicable and must provide any assistance according to Service Manager requests.

Table 2.7.3 - Stage 3: 60 Minute Notification Stage

Process Stage	Role	Responsibility
60 Minute Notification Stage	Provide any further assistance or information as requested by the Regional Control Centre (RCC).	Providers Network Control Centre (NCC) (or equivalent) must respond to requests as soon as reasonably practicable and must provide any assistance according to RCC requests.

Detailed Structural Assessments and Technical Approval

The effects of STGO vehicles must be assessed in accordance with BD86.

For SO Vehicle Movements the following requirements apply unless expressly stated otherwise in the Provider's contract:

(i) Load capacity assessments of structures for proposed vehicle movements, other than those using ESDAL screening, must be subject to Technical Approval procedures in accordance with BD2.

(ii) The Provider must provide an estimate of the costs of assessment of structures for route clearance to the Service Manager.

(iii) The estimate of cost of assessments of structures will be forwarded by the Service Manager to the applicant applying for a route for a SO vehicle movement. A suitable letter template is included in this Appendix. The Service Manager will advise the Provider to undertake the assessments once confirmation has been received by the Provider that costs will be met by the movement route applicant.

(iv) The applicant will be given a copy of the Assessment certificates for Load Assessments for which he has paid.

(v) On completion of appraisal of the route for a proposed SO Vehicle movement the Provider must notify the AIL Team of the suitability of the route using the form included in this Appendix.

Electronic Service Delivery for Abnormal Loads

The ESDAL website is designed to help haulage companies plan their journeys when moving abnormal loads. The system provides an online mapping tool to enable hauliers to plot their route and then automatically notifies the details to the relevant road owner, structure owner and police. The website has been developed for the Highways Agency by Serco Integrated Transport and is designed for all parties involved in moving abnormal loads.

ESDAL provides an automated route appraisal for all stakeholders and allows structure owners to manage structure data online by amending or adding structure attributes. They can also add constraints, such as roadworks, special events or local restrictions.

Police, road and structure owners can also collaborate with a notifying haulier online providing feedback to a haulier if their route is unsuitable.

It is recommended that this free service is used by all Providers. Those who wish to find out more about ESDAL, or register their details online, should visit the website: www.esdal.com

Table 2.7.4 – Abnormal Indivisible Load Special Order Process - Stage 1

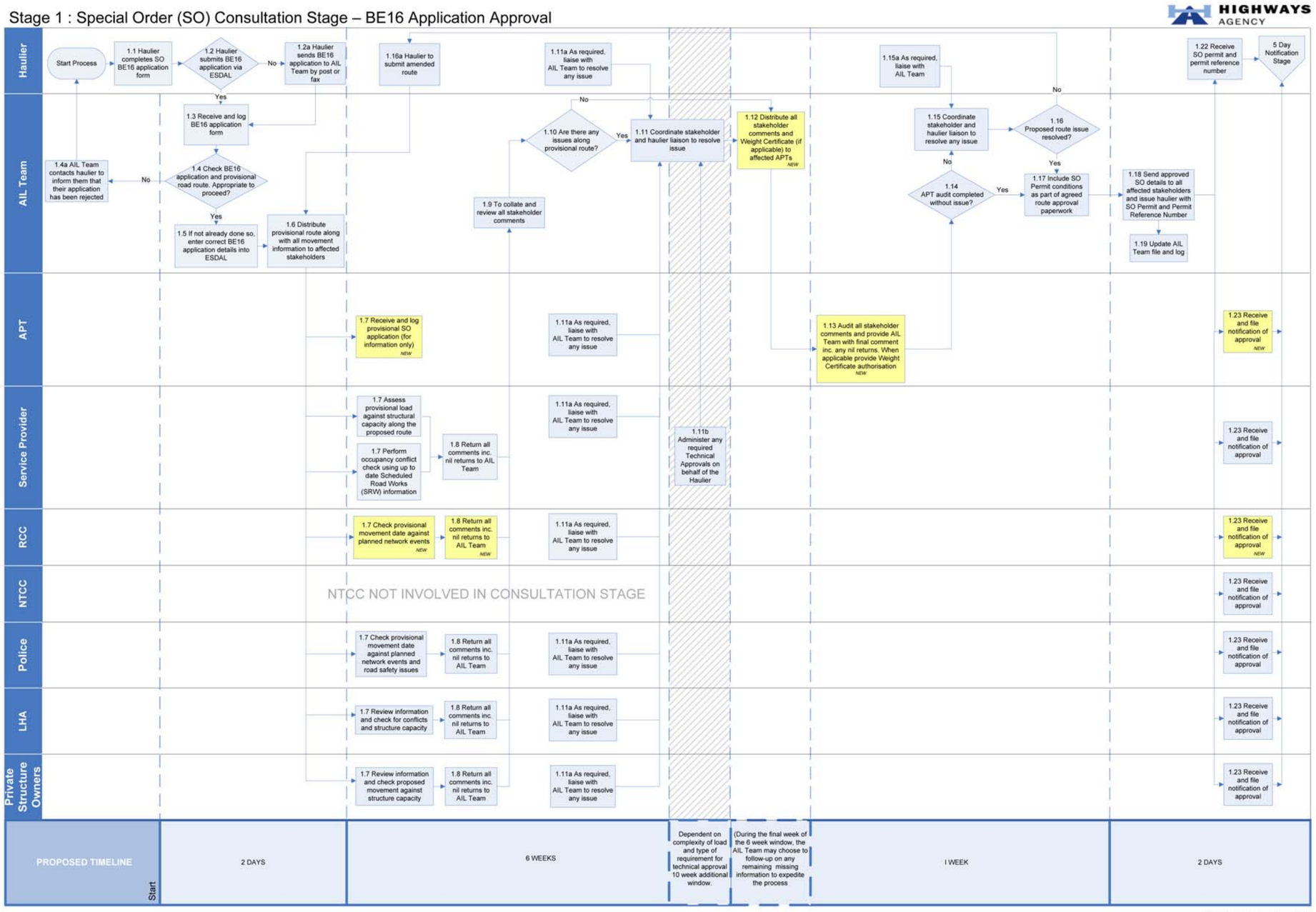

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Table 2.7.5 – Abnormal Indivisible Load Special Order Process - Stage 2

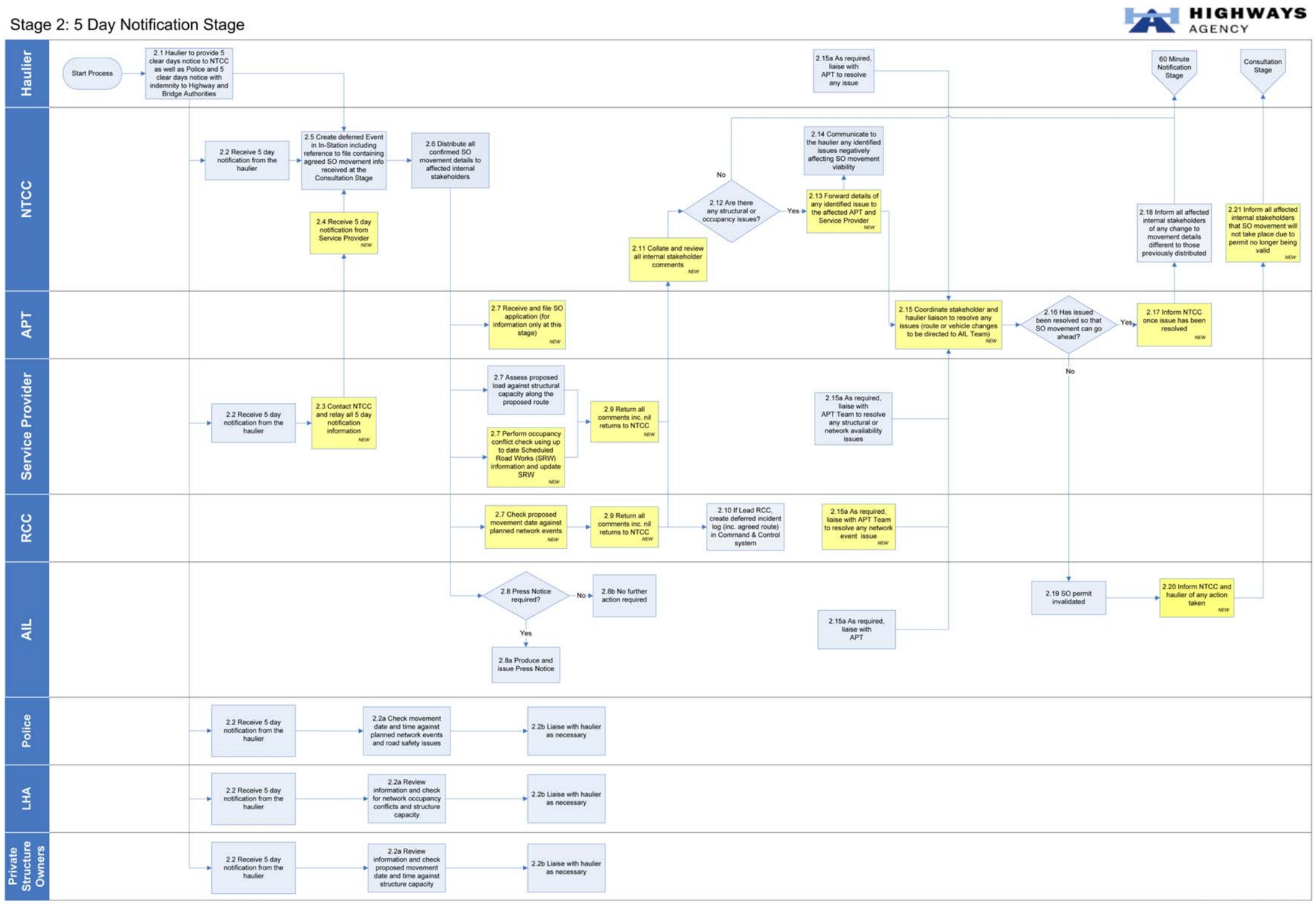

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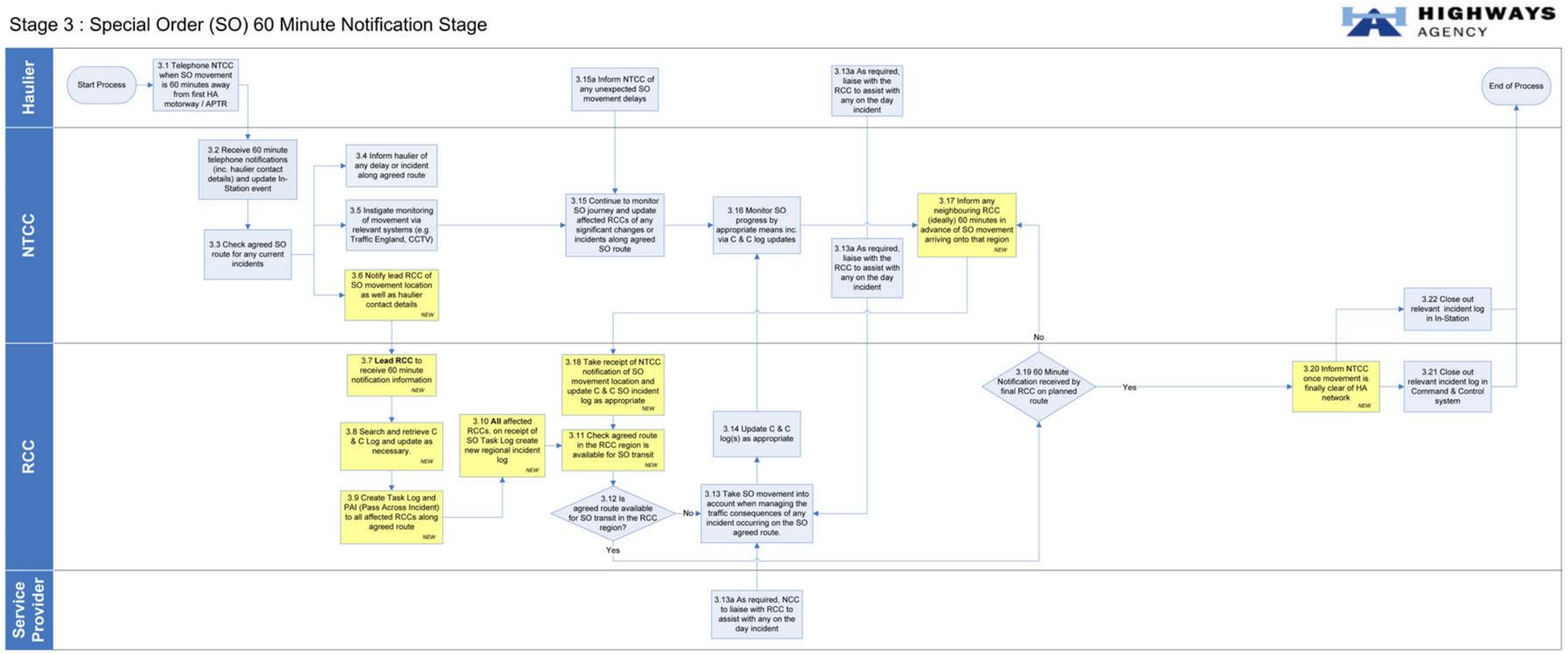
Table 2.7.6 – Abnormal Indivisible Load Special Order Process - Stage 3



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SPECIAL ORDER MOVEMENTS

Notification of suitability of route with respect to the load capacity of structures.

HA reference:

Maintenance Area:

Movement reference/name:

Description of route in Area:

Description of Vehicle Train considered: *[may be attached as a separate sheet – this would include wheel layout of the vehicle train, gross weights of vehicle and tractors, tyre contact areas, wheel and axle weights, etc]*

Results of Assessment: *[list all structures affected by the route]*

Structure Name	**Structure Number**	**Pass/Fail**	**Comments**
			[Include date of assessment, note of critical elements, any cautions/conditions that apply. These might include vehicle speed, coincident loads, position of vehicle on carriageway etc]

I confirm that the above assessments have been carried out in accordance with HA procedures including those for Technical Approval.

The vehicle may pass* / not pass* over this route subject to any conditions in the comments for each structure *[* delete as appropriate]* and subject to the general cautions and conditions given below:

[List all comments / cautions / conditions that apply generally to the proposed route]

Signature:

Bridge Manager

Name:

Date:

Provider:

NOTES

1 This form is to be completed by Provider.

2 The above results only apply to the movement being considered based on the assessment standards and the condition of the structure at the time this movement request was considered and other conditions noted against each structure. No assumptions shall be made regarding any similar movements along this route, which will each require a further application for agreement.

3 This form shall be faxed and posted to the Regional HA Abnormal Indivisible Loads Administrator/regional business management team for the Area concerned.

4 The Highways Agency's Abnormal Indivisible Loads Administrator shall attach this form to the Weight Certificate required by HA internal procedures before submitting it to the Service Manager for signature.

5 The Bridge Manager is the person named in the Provider's QA procedures as responsible the management of all structures within the Network

Standard text of letter to be sent to Movement route applicant by the Highways Agency

Dear Sir,

[Insert here the unique name by which the abnormal load movement is known]

STRUCTURAL ASSESSMENT COSTS FOR AREA *[Insert HA Area Number or DBFO details]*

Set out below the terms on which the Highways Agency are prepared to instruct *[Name of Provider]* to carry out the bridge assessments described in the Schedule attached hereto associated with the Special Order movement referred to above.

1. *[Name of Company (the Movement route applicant)]* will pay all costs, howsoever arising, incurred by *[Name of the Maintenance Provider]* on behalf of the Highways Agency in connection with the carrying out the bridge assessments including administrative and professional costs and any value added tax. *[Name of Company (Movement route applicant)]* will on accepting the terms of this letter pay an estimate of the costs in the sum of £[……..] to the Highways Agency within 14 days of the date of this letter.

2. On completion of the assessments *[Name of the Maintenance Provider]* will certify the costs incurred and, if the sum certified exceeds £ -----.-- *[Name of Company (Movement route applicant)]* will pay the Highways Agency the difference within 14 days of the date of the certificate, but if the sum certified is less than £ -----.-- the Highways Agency will refund the difference to *[Name of the Company (Movement route applicant)]* within that period.

3. The certificate of costs provided in accordance with paragraph 2 above shall be final, unless an error by the Maintenance Provider is shown to have been made.

I shall be grateful if you would indicate *[your company's or the Company's]* acceptance of the foregoing terms by signing and returning to me the enclosed copy of this letter with the attached schedule and plan / drawing.

Yours faithfully

[Name of Company (Movement route applicant)] hereby accepts the terms and conditions set out in the above letter and requests the *[Name of the Maintenance Provider]* acting on behalf of the Highways Agency to carry out the assessments.

Signed ……

Director

Date ……

Schedule

The assessments comprise *[List the assessments to be undertaken by the Provider]*

1.....

2.....

3.....

APPENDIX 2.8 Temporary Traffic Signs - Special Events

Introduction

This Appendix refers to granting permission for the Automobile Association and others to erect temporary signs on the Network to notify of special Events.

Policy

Current policy is set out in the Department of Transport Network Management Advisory Leaflet entitled “Provision of Temporary Traffic Signs to Special Events”, dated May 1993. Interpretation of Note 2 in the Code of Practice for the erection of temporary traffic signs to special events is that, in the case of motorways, agreed temporary signs must only be erected by organisations meeting the training and operational requirements as detailed in the Code of Practice or by the Provider. On other trunk roads, however, there is no reason to prevent other reputable organisations from carrying out the work providing they comply with the general requirements in the leaflet.

A code of practice for the erection of temporary traffic signs to special Events is included in this Appendix..

The Code of Practice for the erection of temporary traffic signs to special events details the duties of all those parties involved in erecting temporary traffic signs for Events. In order for the process to be effective, including ensuring that Sign Erectors are competent and have appropriate insurances (details included in this Appendix), there are some key duties for Providers. Providers must:

- Review the Event organisers proposals and ensure that proposals are compliant with Standards, do not conflict with works planned by Provider and confirm that the sign location, layout, size and other details are acceptable. Address arrangements for Event organisers informing Provider of any changes and obtaining agreement of change with Provider
- Confirm that training of Sign Erectors is compliant with the requirements of National Highways Sector Scheme 12B, or alternatively to 12A. In addition, both operatives and supervisors shall be aware of, and comply with where relevant, any other guidance, code of practice or advice note.
- Confirm that Sign Erectors are in possession of Motorway Passes and processing applications for Motorway Passes presented by the parties involved in erecting of the temporary signs.
- Ensure that the Insurance provided by the parties involved in the signage works is compliant with requirements
- Agree arrangements for maintenance and removal of the signage with other parties
- Agree arrangements for inspection of signage and removal by Provider in the Event of an emergency or when required to do so by the police or Highways Agency (together with agreement on recharging of Providers costs with Sign Erectors)
- Agree arrangements for recovery of reasonable costs incurred by Provider with Event organisers

Code of Practice for the erection of temporary traffic signs to special Events

General

1. Temporary signs should be provided only for Events expected to attract a considerable volume of traffic from outside the local area and where there is adequate car parking for vehicles directed to the Event. They should not be used on routes where there are already permanent local direction or tourist signs to the site, although for some major Events it may be desirable to indicate other routes to assist traffic management. Signs should not normally be erected more than 48 hours before an Event or retained more than 48 hours after it has ended.

2. The signs must comply with the provisions of the Traffic Signs Regulations and General Directions (currently set out in regulation 53 of the 2002 Regulations) and must give clear information about the route to be followed in a size appropriate to the speed of traffic.

3. The badge of the road user organisation erecting the sign may be included. Commercial names of Event sponsors should not be included unless similar Events in the same areas at the same time make such identification necessary for traffic management purposes. Dates and times should not normally be included since the signs are not intended to advertise an Event but are for people who know about it and need guidance to the site. Such information may however be included if the traffic authority considers it would be helpful to other road users to have advance information about likely congestion and is satisfied that it would not make signs too complicated to be easily legible and so endanger road safety

4. The design, construction, mounting and location of signs should be in accordance with the advice given in the Traffic Signs Manual (TSM) Chapter 8 Sections D4 (Design) and O4 (Operations). The signs should be built to sound engineering principles and be of robust construction but the materials used need not be as durable as those used for permanent or portable signs. The fixings used must not damage the posts to which signs are fixed.

5. Signing proposals should be put to the appropriate traffic authority in time for them to be given proper consideration and for the police to be consulted where necessary. This should normally be at least 13 weeks before the Event. Proposals should include information about the nature of the Event, the expected number of visitors and the provisions for car parking. The distance from which signs should be provided and the number of routes to be indicated depends on the nature of the Event and the volume of traffic anticipated but once signing has commenced adequate continuity should be provided along the route. Signing for up to 5 miles or from the nearest A or B road should usually be adequate. More extensive signing may be appropriate for Events which are expected to attract very large numbers of visitors (e.g. major air shows) The traffic authority is the final arbiter of the signing appropriate for any Event and may remove or re-site any signs which have not been approved at the cost of the body which erected them.

6. It is very rarely appropriate for signs to Events to be erected on motorways. Only where there are traffic management benefits for the Highways Agency should fixed temporary signs be used on the motorway network e.g. such as where traffic is required to use a different junction than the one normally used to access the location of the Event, or where specific vehicle or road user types have to use different junctions.

7. Organisations erecting temporary traffic signs on the highway must take all necessary measures to avoid danger to the public or obstruction of traffic during the operation as specified in TSM Chapter 8 and the booklet "Safety at Street Works and Roads Works a Code of Practice". These organisations are responsible for the cost of making good any damage to street furniture and Statutory Undertakers' equipment resulting from the erection of the signs and must have adequate public liability insurance cover. They will be required to indemnify the traffic authority against any claim arising out of an accident alleged to have

been caused by the inadequacy of a temporary sign whether in siting, visibility, insecure mounting or other cause.

8. The organisation erecting temporary traffic signs shall indemnify and keep indemnified the Secretary of State, his servants and agents in respect of any claims or losses of any person (including, for the avoidance of doubt, the organisation and the Secretary of State) which may arise out of, or in the course of or in connection with the operations.

Strategic Road Network (Safety)

9. Working on the Strategic Road Network potentially exposes workers to significant extra risks than those posed on other roads. Therefore, only organisations which can show an adequate level of training and competence will be give permission to place signs on motorways. Other organisations may have any agreed signs placed on the Strategic Road Network by the relevant Provider.

10. For both road worker and road user safety it is imperative that any operative on the the Strategic Road Network must have sufficient training to be able to complete their work. For those organisations with permission to place signs on a motorway all operatives which will be required to be on a live carriageway at any point of the work must be trained to the relevant level of National Highways Sector Scheme 12B, or alternatively to 12A. In addition, both operatives and supervisions shall be aware of, and comply with where relevant, any other guidance, code of practice or advice note. This includes, but is not limited to, the documents listed in paragraph seven above as well as Departmental Interim Advice Note 115 and 'Guidance for Safer Temporary Traffic Management - Issued 2002'.

11. As most motorways have three or more lanes the readability of temporary signs at longer viewing distances is of greater importance than other roads. It is vital that the design and manufacture of signs is sufficient to give an acceptable reading time for drivers in the outside lanes. To ensure this the staff within organisations directly involved with the manufacture and/or design of the signs are required to meet the training and competency levels set in the National Highways Sector Scheme 9A.

Strategic Road Network (Operational)

12. There will be a need to synchronise the operations of those erecting the Event signs with the operations of the Provider and others carrying out work on the the Strategic Road Network. As part of those discussions the following will need to be agreed

- Sign location, layout, size and other signage details
- Insurance provision
- Training of operatives involved in accordance with paragraph 10 above and, if required, to meet requirements of the Provider
- Arrangements for sign removal including provision for removal by the Provider if not removed by Sign Erector by an agreed date and emergency removal or repair by the Provider if found to be in an unsafe condition or instructed to do so by police or Traffic Officer Service (and agreement on recovery of Providers costs with Sign Erector)
- Arrangements for informing and updating the Provider, Traffic Officer Service and police on progress in placing, maintaining and removing signage.
- If there are any site specific risks, the Provider may require the supply of a method statement for sign placement, maintenance and removal together with associated works. No signage or associated works is permitted until the method statement has been accepted in writing by the Provider.
- If the Provider or Event organisers wishes to make use of the either the Highways Agency's portable or fixed VMS to help sign an Event then this should be carried out in accordance with AMM09 and through agreement with the National Traffic Control Centre (contactable at presigningandtm@tistrafficinfo.com)

13. Operatives employed by Sign Erector or 3rd parties in the provision of the signs will be required to have Motorway Passes. All applications for passes should be submitted to the Provider so that they remain aware of operatives working on their Network. The Provider is expected to work with due haste to allow the timely placement of signs.

14. An agreement on placing signs is required under Section 65 of the Road Traffic Regulation Act 1984 prior to permission being given to place signs on the network.

15. The Provider must advise the Service Manager that specific permission to Section 65 must be given.

16. Temporary traffic signs to special Events shall only be placed on Managed Motorways or where roadworks are present by the Provider or the main works contractor. Alternative, advanced, signing may be appropriate.

17. Costs incurred by the Provider in agreeing location, layout and signage details is covered by the existing contract. However any costs incurred by the Provider as a result of either placing signage or overseeing the placement of signage (including maintenance and removal) works on the motorway may be reclaimed from the Sign Erector or 3rd party requesting the temporary traffic signs to special Events.

Insurance details for Erectors of Temporary Traffic Signs to Special Events

Details of level of insurance to be provided by Motoring/Signing organisation shall be as follows.

Definitions

Sign Erector the organisation proposing to place Temporary Special Event Signs on the Strategic Road Network where the Secretary of State is the Highway Authority

Access Date Date from which any access to the Strategic Road Network is required in order to carry out work associated with placing or removal of signs

Closure date Date when all Event signs and any associated temporary arrangements are removed from the Strategic Road Network.

Placement Period Period between commencement of any works associated with the placement of the Temporary Event Signs and the completed removal of all Temporary Event Signs and any associated arrangements

Risks and insurance

The amount of the minimum limit of indemnity for insurance in respect of loss of or damage to property (except the Network, Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the Provider) caused in connection with this contract for any one Event is £40,000,000 (Forty Million Pounds).

The amount of the minimum limit of indemnity for insurance in respect of death of or bodily injury to employees of the Provider arising out of and in the course of their employment in connection with this contract for any one Event is £10,000,000 (Ten Million Pounds).

The amount of the minimum limit of indemnity for insurance in respect of claims made against the Provider arising out of his failure to use the skill and care normally used by professionals providing services similar to the Services is £5,000,000 (Five Million Pounds). The minimum limit of indemnity applies in the aggregate in any one period of insurance for claims arising out of pollution or contamination.

The Sign Erector will provide the insurances stated in the Table 2.8.1 below and in accordance with the above requirements. The Provider must review details provided to ensure that insurance meets the requirements.

The insurances (other than employer’s liability and professional indemnity insurance) are in the joint names of the Parties and provide cover for Events which are at the Sign Erector’s risk from the access date until the end of the Closure date or all the Services have been completed (whichever is the later) or a termination notice has been issued.

Table 2.8.1 - Insurance Table

Insurance against	**Minimum amount of cover or minimum limit of indemnity**
Loss of or damage to any Scheme carried out by the *Sign Erector* in the course of construction.	The full reinstatement cost (including demolition, debris removal and inflation).
Loss of or damage to Materials.	The replacement cost (as new).
Loss of or damage to Equipment or Secretary of State or Provider's Stocks.	The market value at the time when the loss or damage Occurred.
Liability for loss of or damage to property (except any Scheme carried out by the *Sign Erector* in the course of construction, Materials, Equipment and Employer's Stocks) and liability for bodily injury to or death of a person (not an employee of the *Sign Erector)* caused by any activity in connection with this contract (including liability arising out of intrusive asbestos surveys).	The amount stated in the Contract Data for any one Event with cross liability so that the insurance applies to the Parties separately.
Loss of or damage to Secretary of State or Provider's Vehicles.	The market value at the time when the loss or damage Occurred.
Liability for death of or bodily injury to employees of the *Sign Erector* arising out of and in the course of their employment in connection with this contract (including liability arising out of intrusive asbestos surveys).	The greater of the amount required by the applicable law and the amount stated in the Contract Data for any one Event.
Liability of the *Sign Erector* for claims made against him arising out of his failure to use the skill and care normally used by professionals providing services similar to the Services (including liability arising out of intrusive asbestos surveys).	The amount stated in the Contract Data for any one Event.

Insurance policies

The Sign Erector shall submit to the Provider for acceptance certificates which state that the insurances required are or will be in force before the starting date, for signs remaining in place over months at least two monthly intervals when instructed by the Provider to do so.

The certificates are signed by the Sign Erector's insurer or insurance broker.
Insurance policies include a waiver by the insurers of their subrogation rights against directors and other employees of every insured except where there is fraud.

The Parties comply with the terms and conditions of the insurance policies.

Any amount not recovered from an insurer is borne by the Secretary of State for Events which are at his risk and by the Sign Erector for Events which are at his risk.

If the Sign Erector does not insure or fails to maintain insurance over the placement period

The Provider may insure a risk which the agreement requires the Sign Erector to insure if the Sign Erector does not submit a required certificate. The cost of this insurance to the Provider is paid by the Sign Erector.

If, at any time during the Placement Period, the Sign Erector is unable to obtain any of the insurances required by this contract on reasonable commercial terms or at commercially reasonable premium rates, the Sign Erector immediately notifies the Provider. The Provider makes recommendations to the Network Board on what measures should be taken to protect the interests of the Parties in the absence of such insurance. The Network Board decides on what measures should be taken to protect the interests of the Parties in the absence of such insurance.

The Highways Agency shall annually review the above insurance requirements and advise of any changes.

APPENDIX 2.9 Motorway Passes

15.3.1 Introduction

Motorway Passes are issued for two purposes. They record that the Secretary of State has granted exemption from The Motorway Traffic (England & Wales) Regulations 1982 to persons in connection with “any inspection, survey, investigation or census”.

Motorway passes also record that the holder is a person engaged in duties for which a general exemption to the *Motorway Regulations* exists. Such duties include “the maintenance, repair, cleaning, clearance, alteration or improvement of any part of the motorway” and “the erection, laying, placing, maintenance, testing, alteration, repair or removal of any structure, works or apparatus, in, on, under or over any part of a motorway”.

Motorway passes state the name of the holder, their employer and detail the purpose of the pass together with mandatory instruction on safety requirements. To enhance network security all new passes issued by the Highways Agency include a digital passport style photograph of the holder.

All passes are currently issued for a maximum duration of one year and must be returned to the Highways Agency upon expiry or if no longer needed.

15.3.2 Motorway pass holders

Providers’ staff undertaking “any inspection, survey, investigation or census” on the motorway must hold a valid motorway pass.

Providers are encouraged to issue motorway passes to their staff and any sub-contractors, safety inducted suppliers etc engaged in those duties for which the general exemption applies, as detailed above, to demonstrate they have the authority to be on the motorway.

15.3.3 MAPPA System

To better control and simplify the process for applying and issuing motorway passes the Highways Agency have developed an internet based system termed MAPPA.

The Provider must make applications for motorway passes using the MAPPA system.

The Provider must develop a process to ensure that applications for passes using the new system are only made for those persons with the appropriate competence for the duties to be undertaken.

The Provider must nominate a user(s) to be trained in the use of the MAPPA system to the Highways Agency’s regional business management team. They will be trained in the use of the system by staff from the Highways Agency’s BIS section.

Following training, MAPPA users will be able to make immediate use of the system to apply for motorway passes for their staff, or others under their contractual direction.

Applications for passes will be processed by staff working in one of the Highways Agency’s regional business management teams and will be despatched by post to the MAPPA user for distribution to those named. Passes will be accompanied by a letter, part of which should be signed and returned to the addressee to confirm receipt.

MAPPA users can use the system to track the progress of applications. Although the system facilitates the prompt supply of passes, Providers should allow two weeks for supply following submission of applications.

The MAPPA system automatically generates e-mails to remind nominated user when passes are due to expire to allow consideration to be given to renewing them. Such reminders will only be for passes issued with the new system.

Any feedback on the use of the MAPPA system should be directed to the Highways Agency's Network Management Policy Team.

15.3.4 Motorway passes for third parties

Third parties may also be granted authority to exemption from the *Motorway Regulations* for "any inspection, survey, investigation or census". Providers must direct any enquiries for motorway passes from third parties to the Highways Agency's regional business management team.

Staff within the Highways Agency's regional business management team will arrange for third parties to be vetted to ensure that there is a genuine need for motorway passes to be issued. As part of this vetting process the third party will be appraised on the need to liaise with the Provider before the motorway is accessed.

In some circumstances where third parties require motorway passes to support the Highways Agency's objectives, e.g. design agents, the Highways Agency may grant access to the MAPPA system. Such access is only granted to those third parties that fulfil safety and procedural requirements. Enquiries from third parties seeking such access should be directed to the Highways Agency's regional business management team.

Appendix 3

Incident Response Operational Requirement

Version 1.3

3.1 – Reporting of Critical and Major Incidents

3.2 – Network Information Reference Portfolio (NIRP)

3.3 – Emergency Diversion Route Procedures

3.4 – Traffic Officer Service and Service Provider Local Joint Operating Principles

Appendix 3

Appendix 3.1

Reporting of Critical and Major Incidents

Table A3.1.1

Ref.	Requirement		Frequency
1.	Report in accordance with the Incident Data Capture Sheet (unless stated otherwise), all Incidents involving the following:		Immediately following each occurrence
	a.	Any Incident deemed to be a 'Critical Incident' in accordance with contingency planning arrangements.	
	b.	Any Incident deemed to be a 'Major Incident' in accordance with the Civil Contingencies Act (2004).	
	c.	Death and / or serious injury to operatives.	
	d.	Death and / or serious injury to road users.	
	e.	Moderate or serious congestion or anything likely to cause disruption to road users.	
	f.	Any serious Incident involving a vehicle carrying dangerous goods (including for example hazardous chemicals, inflammable liquids or radioactive materials).	
	g.	Causing serious damage to the road network.	
	h.	Spillage of substances hazardous to health, environment and/or infrastructure.	
	i.	Incidents involving children, minibuses, passenger coaches or public service vehicles.	
	j.	Incidents likely to generate significant media or political interest.	
	k.	Crossover of a vehicle from one carriageway to another.	
	l.	Security alerts including terrorist threats.	

Ref.	Requirement		Frequency
	m.	Suicide or attempted suicide.	
	n.	Any Incidents occurring in or around work areas using the Highways Agency Accident Incident Reporting System (AIRSweb).	
2.	Report in accordance with the Incident Data Capture Sheet (unless stated otherwise), any of the following with regard to bridges and structures:		Immediately following each occurrence
	a.	impact with bridge support, bridge soffit where serious damage occurs;	
	b.	'Parapet Impact Report' in accordance with the **Notes** at the end of this Table where serious damage occurs.	
	c.	other severe effect on component parts of structures;	
	d.	hazardous chemical spillage on or near to structures.	
	e.	where the structure may have had a contributory effect to the accident.	
3.	Report all Incidents causing damage to the road network inventory.		Monthly
4.	Report in summary format all Incidents in 1, 2 & 3.		Quarterly
5.	Analyse Incidents on the Area Network and report findings to the Employer including recommendations as appropriate (through liaison with the Regional Intelligence Unit).		Monthly
6.	Undertake an Incident trend analysis of the Incidents occurring on the Area Network and report findings to the Employer including recommendations as appropriate.		Quarterly
7.	Report on progress made against the Area Safety Action Plan through the annual report.		Annually
8.	Provide an annual report of all known bridge impacts.		Annually

Notes to support Parapet Impact Report

The purpose of the report is to provide facts that will enable the Employer to establish if the parapet performed as intended, develop improvements in performance if required, and help in the establishment of liability if appropriate. It may also help in establishing trends.

The following information shall be provided in the report sent to the Service Manager when a parapet impact requires an immediate call out and making safe. Actions associated with this are set out below:

- Details of the location including a location plan, a 1:100 plan of the site and a cross section drawing of the existing road layout.
- Details of the geometry of the highway in the vicinity of the impact.
- Details of the vehicles that collided with the parapet. This should include the age, make and model of the vehicle. If possible details of the laden state of the vehicle. To aid any future identification of vehicles any number plates at the scene shall be collected, retained and reported.
- Details of the weather and road conditions at the time of the strike.
- The geometry of the Incident. This should include position of the vehicle or vehicles immediately after the strike and if possible the path of the vehicles before the strike.
- The position of all parapet components after the strike should be surveyed and recorded on a scale location plan.
- The type of parapet and safety barrier, transition, connection connecting to the parapet

The damage to the parapet shall be surveyed and recorded on a drawing of a suitable scale or scales in detail commensurate with the nature of damage. Measurements of the deflected shape that have been taken should be shown on the drawings.

Where allowed and where possible clear photographs shall be taken of the damaged parapet, debris and vehicles before they are moved. Photographs of the damaged parapet and vehicles after separation are also required.

Any Emergency Services reports shall be included if available including:

- Details of injuries.
- Diary of events.
- Details of any damage to ancillary equipment – for example Traffic Master Sensors.
- All materials retrieved from the damaged parapet shall be retained and the storage location recorded. (This shall include components that are still attached to the structure such as the base plates of severed posts. Where possible components must be removed intact. This would include for example posts that are severely damaged but still intact). These details shall be included in the report.

If preliminary inspection of components suggests that corrosion has locally weakened components then these should be dried and stored in a hermetically sealed bag with a decadesent. An example of this might be discovery of a fracture surface that is partly corroded.

The provenance of any information from third parties must be given.

No opinion shall be given in the report. If it is considered that the information given in the report has implications for other structures then the Provider shall submit a separate report to the Employer in a format to be agreed at the time.

Appendix 3.2

Network Information Reference Portfolio (NIRP)

3.2.1 Introduction

The Network Information Reference Portfolio (NIRP), previously referred to as 'Box of Reference' contains comprehensive information about the service provider's area network to be used during the management of crises, incidents, events and emergencies.

The NIRP will be published on the Cabinet Office secure web site 'Resilience Direct' with appropriate restrictions in place to ensure only authorised account holders can gain access. Relevant stakeholders / responders will be informed by email, including hyperlink, whenever a new version is published.

The NIRP must carry an appropriate security classification, be published in a common standard electronic format accessible to all appropriate third parties without need of specialist or bespoke software, contain a 'hyperlinked list of contents / index' and have clear version control.

The Provider Contingency Plan Manager (or equivalent) will as a minimum, review and update the contents annually or sooner where there is reason to consider the current version unfit for purpose.

3.2.2 Information held within NIRP

There are two groups of information contained in the NIRP:

3.2.3.1 Area Network information for stakeholders (external responders)
3.2.3.2 Area Network information for HA, Provider (internal responders)

3.2.3 Contents of the NIRP

Below is a suggested list of contents for the NIRP. This information can be inserted within the document as text, graphics or map form and may also reference other documents and plans. This data should be stored electronically and include file paths or hyperlinks to their location

3.2.3.1 Area Network information for external responders

- Emergency Diversion Route Document
  - Process for activating EDRs
  - Individual EDR route cards for each link

- GIS shape file for each EDR*

- Schematic diagrams and key location features of the Area Network
- Emergency crossover points
  - Location of all central reserve crossing points
    - Including type of crossover
    - Include equipment required to utilise
- Emergency access points on Area Network
  - Locations from where the Area Network can be accessed, other than junctions
- Area Network depot locations
  - Location and capability of HA/Provider depots
- Sign bin inventory
  - Location of sign bins
  - Contents of sign bins
- Area Network lighting
  - Details of locations of the Area Network with street lighting
    - Include details of ‘full switch off’, ‘midnight switch off’, etc.
    - Include process to switch on ‘full switch off’, ‘midnight switch off’ locations
- Traffic Officer boundaries
  - RCC boundaries
  - TOS patrol status of all routes
- High risk weather sites
  - Details of locations on the Area Network vulnerable to severe weather;
    - Snow
    - Ice
    - High winds
    - Flooding
    - Fog
- Network Rail bridges over the Area Network
  - Including Network Rail reference numbers
- Types of communication systems for liaison with all stakeholders
  - Airwave talk groups
  - Airwave call signs
  - Details of Airwave interoperability

3.2.3.2 Area Network information for internal responders

- Vulnerable nodes
  - Potentially vulnerable structures
  - Critical nodes (major intersections, CNI, etc.)
  - Areas of potential geotechnical instability (risk of land slip)
- Hazardous sites adjacent to the Area Network

- Cross referenced to multi agency plans
- Details of external (civil contingencies) risks to Area Network operation
    - Industrial sites (COMAH)
    - High pressure pipelines
    - Airports
    - Large water reservoirs

- Multi agency (LRF) emergency plans
    - Copies of or links to all plans which involve closure of SRN
    - Abridged Provider action card for each plan
- Provider operational plans

  Copies of or links to Provider/HA owned response plans
- Business continuity plan
- Police boundaries and contact details
- Emergency Services contact details
- Location of traffic signals
    - Location of all traffic signals on or controlling access to / from the SRN
    - Contact details of authority responsible for operation of each set of signals
    - Contact details of organisation responsible for maintenance & repair of each set of signals
- Liaison with adjacent areas
    - Cross border working protocols
- Contact details for Provider welfare
- Plant and equipment
    - Inventory and location of plant / equipment
- Specialist contractors to assist the Provider
    - Capability
    - Contact details

Appendix 3.3 - Emergency Diversion Route Procedures

Introduction

The Provider must familiarise themselves with the National Guidance Framework for Operational Activities between Local Highway Authorities and the Highways Agency and the Detailed Local Operational Arrangements, in order to identify, establish and maintain EDRs.

Providers are responsible for:

Identifying and arranging the establishment and subsequent maintenance of EDRs in close partnership with those LHA Traffic Managers whose authority's roads connect with the Highways Agency's network in their Area in accordance with Appendix 3.3.1.

Annually reviewing details of each link on the Area network indicating the current status of EDRs (status codes found in Appendix 3.3.3).

Liaising with the freight transport industry (where available through the 'Freight Quality Partnership') to ensure the industry has opportunity to contribute to the planning of EDRs.

Liaising with the Police and TOS to ensure EDRs and associated operational arrangements agreed with the LHA are understood and supported by the Police and TOS.

Producing the Map/Route Card and other documentation for each EDR when agreement has been reached with the LHA for each EDR (specification included in Appendix 3.3.5).

Inspecting the EDR for incidents / roadwork's prior to implementation and reporting any issues to the RCC.

Liaising with the LHA as required prior to a decision to use an EDR (where a decision is possible) for those parts of the Network where there is no TOS patrolling, subject to agreed local operating procedures.

Attending a review meeting arranged by the LHA, normally within 2 weeks of receiving a notification that the LHA has identified:
(i) a required or proposed change to, or
(ii) operational issues which require review (but do not require a formal 'incident debrief') of an agreed EDR.

Appendix 3.3.1

Identification

In close liaison with the LHA Traffic Manager, Providers should identify EDRs for the Area network for which they are responsible in co-operation with LHAs and other stakeholders.

The identification is based on a risk assessment (a framework for EDR risk assessment is set out in Appendix 3.3.2) to assess suitability of any potential route for the emergency diversion of traffic off the Highways Agency's network. A record of risk assessment is retained by the Provider.

Where not possible to identify a suitable EDR, a record of the assessments carried out in seeking to identify a suitable EDR will be retained by the Provider.

Where it is identified an EDR is suitable only for use by restricted classes of traffic or there is no suitable EDR available, but infrastructure improvement on the LHA network could enable one to be provided, the Agency will, subject to the agreement of the LHA, identify costs of any improvements required and provide a business case for funding (or joint funding of the work, if appropriate), so the improvement scheme can be considered within any future works programmes.

Where possible and with lack of a primary tactical route, a secondary (alternative) EDR will be identified. It is recognised that such opportunities will not generally be available.

Establishment

The Provider will agree arrangements with the LHA for establishing a necessary and appropriate signing infrastructure for each EDR on the LHA's roads.

The LHA will undertake the sign design. Where the LHA has insufficient resources to complete the design in a timely manner, by request of the LHA, the Provider will assist with the design of EDR signing.

EDR signing will be designed to incorporate local circumstances, and will:

(i) Include sufficient repeater signs to ensure confidence is maintained for diverted road users throughout their journey and

(ii) be 'closed out' between the start of the EDR and subsequent return to the Agency's network.

Sign installation should be undertaken by the LHA or in co-operation with the Provider.

Secondary EDRs will not be permanently signed unless the LHA and the Agency agree exceptional circumstances make this advisable. However, documentation referred to in Appendix 3.3.5 is required for EDRs.

Maintenance

The LHA will undertake routine inspections of EDR signing on its roads in accordance with the LHA's normal cyclic maintenance regime for safety and service inspections. A copy of their inspection report should be forwarded to the Provider within 28 days of the inspection being carried out.

The LHA will rectify any defects of EDR signs in accordance with their performance standards for rectification of defects which represent an imminent danger to road users.

The Provider is to carry out an annual inspection of each EDR and associated signing.

The Provider is to ensure the Service Manager is advised of any actions required as a result of inspections or reviews and to take such actions necessary to ensure a robust network of EDRs continues to be available.

Appendix 3.3.2

Framework for EDR Risk Assessment

The Provider must conduct an EDR risk assessment. As with any design or management decision, the person responsible for undertaking the risk assessment must be appropriately skilled and experienced to properly undertake the task, whilst taking into account the particular and unique circumstances of the potential EDR being considered.

TACTICAL DIVERSION ROUTES - RISK ASSESSMENT GUIDANCE						
Agency network Route:	…… ….	Agency network Road location requiring diversion:	…… .	Proposed diversion on LHA road	…… ….	
Identified Risks						
Risks arising from diversion of traffic onto the proposed diversion route	All classes of road users	Increased traffic volumes	Change in the traffic composition on the diversion route, particularly with regard to increased proportion of HGVs	Other risks?	Other risks?	Other risks?
Risk Assessment						
Identified Risks						
Risks arising from particular features on the proposed diversion route	Schools	Hospitals	Sports venues	Level crossings	Other risks?	Other risks?
Risk Assessment						

TACTICAL DIVERSION ROUTES - RISK ASSESSMENT GUIDANCE						
Risks arising from suitability of route for reducing incident-related congestion	Ability of proposed route to accommodate anticipated volumes of HGVs	Height restrictions	Weight restrictions	HGVs unable to negotiate diversion route due to alignment - e.g. by low-loaders grounding, car-transporters, cranes etc damaging adjacent/ overhanging buildings	Sports venues, special events venues etc	Traffic management and control systems operating on proposed diversion route
Risk Assessment						

Risk Mitigation					
Establish different diversion routes for each direction of travel	Hold all HGVs on the network	Hold all AILs, transporters, large cranes, selected AILs,	Arrangements for LHA to manage diverted traffic	Avoidance of critical times, e.g. when activities at	Other mitigation?

		etc on the network	on their network by changing normal traffic management and control	venues, special events etc affect the proposed diversion route are taking place	
Risk Assessment					
Infrastructure improvements (where justified)					
Alignment	Remove weight limits	Other improvements ?	Other improvements ?	Other improvements ?	Other improvements ?
Risk Assessment					

Appendix 3.3.3

EDRs are classified as follows:

Class 1

A route agreed as a suitable EDR under the arrangements set out in this procedure by co-operation of LHA, TOS and the Police and is permanently signed.

Class II

A route is accepted by all parties as a possible EDR, but is not signed, and may not be formally accepted by the LHA.

Class IIIa

A route is identified as a potential EDR but is acknowledged to be inadequate at certain times for diversion of traffic off the Agency's network and there is no alternative superior EDR option.

Class IIIb

A route is identified as a potential EDR but is acknowledged to be inadequate for diversion of traffic off the Agency's network due to physical constraints and there is no alternative superior EDR option.

Appendix 3.3.4

Documentation for EDRs

Operational and Infrastructure Records and the EDR File

The Maps/Route Cards, as described in F1 in Appendix 3.3.5, for the agreed EDRs will be held as the *'EDRs File'.*

Documentation records for each EDR are needed to meet the following requirements:

(i) a map-based record showing the EDR;

(ii) operational information and

(iii) a record of signing and other infrastructure for the route.

Appendix 3.3.5

Document Format and Requirements

F1 Map/Route Cards

Shall show the essential details of the relevant Agency network road, the relevant link closure to which the EDR applies and the EDR on the LHA network using an OS map base.

F2 Operational information, F3 – Sign and Infrastructure information and F4 – Additional information

Shall be in a format agreed by the partners agreeing and operating the route.

Each record document shall include:

(i) EDR description;

(ii) EDR Identification*;

(iii) the date of issue,

(iv) the names of the stakeholders agreeing the route and

(v) subject to their agreement, the logo of each stakeholder.*

Route identification number to be of the format:

Road number / Route Direction followed by its route direction (BD- Bi-Directional, S- Southbound, N- Northbound, E- Eastbound and W-Westbound)/Agency Area number (1-24) / Diversion number (to be a unique number for the Area, using a suitable system agreed with the SDT). A diversion route will be assigned a number similar to ‘A1-BD-14-11’

The information requirements of the documentation are as set out in F1 to F4 below.

F1 Map/Route Card

 The part of the Agency’s network which is closed;

 the EDR;

 the road numbers of all relevant Agency network roads and the EDR;

 directional indication as necessary and

 boundaries (if any) between:

(i) LHAs

(ii) Agency Area operational boundaries;

(iii) TOS operational boundaries (if applicable) and

(iv) Police service operational boundaries.

F2 Operational Information

 Sufficient detail of junctions both at the Agency network/LHA road junction and at junctions on the EDR to illustrate an exact route to be followed by diverted traffic;

 local names of junctions and any other significant ‘landmark’ features on the Agency network;

 major traffic generators on the EDR, or likely to affect/be affected by its use;

 for dual carriageways on the Agency network, whether the emergency diversion applies to closures of both carriageways or only to one direction;

 whether the EDR is for use with two-directional traffic (i.e. can be used for diverted traffic in both directions whether both carriageways of the Agency network road link are closed, or not);

 whether the EDR is suitable for all types of vehicle or not;

 special arrangements for emergency diversion or retaining HGVs and any other vehicle class, if applicable;

 if the EDR cannot be used by diverted traffic in both directions, the directional EDR information to be used in the event of a closure of both carriageways. Implementation procedures for the tactical diversion route, including responsibilities for each action;

 potential traffic problems that may be encountered with use of the EDR (e.g. peak-time congestion, regular public events such as sports matches, etc);

 requirements for times when use of the EDR may be of limited effect (e.g. at peak times) and/or

 special arrangements e.g. for controlling rate of egress from the Agency network road at peak times, 12

 special operating arrangements for the EDR (e.g. requirements for adjustment to the phasing of traffic signals on the LHA network or for traffic

signals under the Agency's control at the junction of the Agency and LHA networks, change of signed priority at junctions etc);

 operating arrangements including responsibility for ensuring that traffic diverted onto a EDR does not run on untreated surfaces in winter conditions;

 responsibilities for changing variable/flap signs and for placing temporary signs and their removal on closedown and

 any requirements for complementary plans for setting VMS for the LHA's (local) and the Agency's (strategic) VMS signs (arrangements should be made through the Agency's (NTCC) regional liaison officer (via the Service Manager) for discussions with NTCC to agree the complementary VMS plans with the LHA).

Contact information

Telephone contact details to be shown for:

 LHA office hours contact,

 LHA out-of-office hours contact

 TOS contact;

 Provider NCC,

 Police Control Room;

 significant traffic generators on, or likely to affect/be affected by use of the tactical diversion route.

F3 Sign and Infrastructure Information

 The symbol sign in use applicable to the tactical diversion route;

 the location and information provided on any flap/variable signs;

 the storage location and inventory for temporary signage;

 the locations in which any temporary signage is to be placed;

 the location of any traffic control equipment on the EDR (e.g. traffic signals);

 the location of any Agency VMS immediately adjacent to the affected Agency network road link.

 the location of any LHA VMS on or relevant to the EDR;

F4 Additional Information

Any information required for effective maintenance and operation of the EDR, including signage which is not shown in documents prepared for A1 to A3 above, is to be recorded in the EDR File, such as the following information:

Permanent Signing

Sign	Sign location

Temporary Signing

Sign	Sign location

Cross-boundary issues

Complete this section if applicable to the route in question for any cross-boundary issues where a EDR lies partly within the area of the Local Authority concerned and partly within the area of a neighbouring Local Authority.

Documentation Records

The documentation records are to be held by the Provider in hard copy and electronically in pdf. format for the duration of their contract and for handover to their successor Provider.

Documentation Distribution

A controlled electronic (pdf.) copy of all the documentation for each EDR shall be provided to the:

- LHA Traffic Manager;
- the Local Authority Emergency Planning Officer;
- the Police;
- the TOS and
- the Service Manager.

The record of agreement shall include those cases where it is acknowledged that no suitable EDR can be identified

One collated set of laminated Map/Route Cards for each EDR shall each be provided LHA and the Police and the TOS and new Map/Route Cards are to be issued as they are agreed.

Providers shall determine their own requirements for distribution of documentation within their own organisations.

Appendix 3.4

Traffic Officer Service and Service Provider Local Joint Operating Principles

Highways Agency

Traffic Officer Service and Service Provider

Local Joint Operating Principles

Document Control

Document Title	HA Traffic Officer Service / Service Provider Local Joint Operating Principles
Author	Greg Taylor
Owner	David Stones
Distribution	
Document Status	Draft

Revision History

Version	Date	Description	Author
V1.0	27 February 2012	First Draft	Greg Taylor

Reviewer List

Name	Role

Approvals

Name	Signature	Title	Date of Issue	Version

Introductory Comments

The Joint Operating Principles (JOP) between Highways Agency Traffic Officers and Service Providers have been superseded by the Asset Maintenance and Operational Requirements (AMOR) as called up by the new Asset Support Contract (ASC).

The JOP included:

- Provider activities the Agency wanted to see delivered on the Strategic Road Network (SRN) but that were not mandated as standards in the Routine and Winter Service Code (RWSC) and Network Management Manual (NMM) specification documents of the current Managing Agent Contract (MAC),

- Reference to and reiteration of existing standards for Traffic Officers and Service Providers,

- Local agreements between Traffic Officers and Service Providers to cover specific ways of working (e.g. Dartford crossing, Severn crossing etc),

- General information about the service provided by both parties.

To ensure the important parts of the JOP are retained, the following action has been taken:

- *Provider activities the Agency wanted to see delivered on the Strategic Road Network (SRN) but that were not mandated as standards in the Routine and Winter Service Code (RWSC) and Network Management Manual (NMM) specification documents of the current Managing Agent Contract (MAC),*

  The activities the Agency require Service Providers to undertake are now mandated as requirements in AMOR with supporting Performance Metrics and Performance Requirement Levels where necessary.

- *Reference to and reiteration of existing standards for Traffic Officers and Service Providers,*

  Where standards for Service Provider activity were included in the JOP, they have been turned into requirements in AMOR.

- *Local agreements between Traffic Officers and Service Providers to cover specific ways of working (e.g. Dartford crossing, Severn crossing etc),*

  Appendix A of this document provides a template for recording local area specific agreements between Service Providers and the Traffic Officer Service where these are required.

- *General information about the service provided by both parties.*

The author, and AMOR Incident Response specialist chapter owner, is currently undertaking a presentation tour of all areas of TMD. Following cascade of this information by Operations Managers to on and off road Traffic Officers, TMD will have a clear understanding of future Service Provider activity.

Service Providers will have access to presentation materials and will also glean information about the current service from the Service Information appendix of the ASC contract.

Appendix A - template for recording local area specific agreements between Service Providers and the Traffic Officer Service.

Local Agreements

Insert any local agreements here

Contact Information

24/7 Contacts

Regional Control Centre	
Post Title	
e-mail Address	
Fax Number	
Telephone/Mobile Numbers	

Service Provider	
Post Title	
e-mail Address	
Fax Number	
Telephone/Mobile Numbers	

Contacts During Office Hours (9:00 – 5:00 Monday – Friday)

Regional Control Centre	
Post Title	
e-mail Address	
Fax Number	
Telephone/Mobile Numbers	

Service Provider	
Post Title	
Name	
Postal Address	
e-mail Address	
Fax Number	
Telephone/Mobile Numbers	

Agreement to the Principles

[*Name of Service Provider Organisation*] as Service Provider (SP) for Area XX and the Highways Agency (the Agency) agree to work in accordance with the principles set out in this document to support the safe and efficient movement of traffic over the road network. As such the spirit of this Agreement has been developed to maximise benefit to the travelling public using the Agency's Network.

These Principles describe a local operational relationship between the Agency and the SP that will be further developed and strengthened in response to ongoing operational experience, for the benefit of all parties and most importantly for the travelling public.

This Agreement will be reviewed annually and more frequently if operational requirements necessitate changes.

Signed on behalf of [ ] (Service Provider)

..... (Signature)
..... (Name)
..... (Title)
..... (Date)

Signed on behalf of the Highways Agency Traffic Officer Service

..... (Signature)
..... (Name)
..... (Title)
..... (Date)

Signed on behalf of the Highways Agency Service Delivery Team

..... (Signature)
..... (Name)
..... (Title)
..... (Date)

Appendix 4

Severe Weather Operational Requirement

Version 1.6

[SERVICE PROVIDER]

[AREA OF RESPONSIBILITY]

SEVERE WEATHER PLAN

2014/2015

DOCUMENT CONTROL AND DISTRIBUTION

Document Owner (responsible for maintenance, upkeep and amendment)	**[Name/Title]**

Document Issue and Revision Record				
Issue	Revision	Date	Issue/Revision Description	Approved

Document Distribution List		
Copy Number	Name	Organisation

The distribution list should include: relevant Service Provider staff, and sub-contractor staff, Highways Agency staff, police authorities, adjacent local highway authorities, adjacent Highways Agency Service Providers (including DBFO companies) and any other key stakeholders such as weather forecast providers. The internal document distribution should include all decision makers and managers. Electronic copies must be made available to the Highways Agency prior to October 1st each year.

The above document control and document distribution tables should be amended to comply with individual organisations' own quality management procedures.

Documents should preferably be distributed electronically and, to preserve format and maintain document control and security, PDF format is recommended.

CONTENTS

Notes for compiler:
This document is a template against which individual Service Providers must base their own Severe Weather Plans.

Instructions are shown in italics e.g. *Service Provider to include details of* …..

Square brackets denote a requirement for area/route specific text e.g. Details of the [Area No / Route DBFO] Network are…..Square brackets also denote contract specific differences allowing this single template to be used for various contract types, including within the Asset Support Contract (ASC). For example, compliers must amend all instances of [Area Network / Network / Project Road] to read either: Area Network, Network or Project Road as per their contract arrangements.

All of the text in red should be removed, completed, replaced or amended to suit local circumstances as appropriate.

Tables should be completed as appropriate or replaced with the Service Provider's own tables. Where the Service Provider's own tables are used they should include, as a minimum, the information detailed within the prescribed tables.

As the Severe Weather Plans will be public documents it is recommended that, to ensure consistency between documents, the basic style and formatting of the template should not be altered.

1 INTRODUCTION

Severe Weather refers to any meteorological phenomena with the potential to endanger safe passage or cause disruption on the [Area Network / Network / Project Road], and includes snow, ice, heavy rain, high winds, fog and high temperatures. As such year round planning is required to manage Severe Weather events in an appropriate manner.

Severe Weather Service comprises the operational and alert procedures, and actions necessary to ensure safe passage on the [Area Network / Network / Project Road] is not endangered by Severe Weather, as far as is reasonably practicable. Winter Service is the element of Severe Weather Service which focuses on the routine precautionary and reactive treatments required to keep lanes on the [Area Network / Network / Project Road] free of ice and snow.

This section of the Severe Weather Plan outlines the scope of the services provided, responsibilities for provision of those services and details the extent of the [Area Network / Network / Project Road] on which the service is provided. The definitions and abbreviations are provided in Appendix B.1.

This Severe Weather Plan for [Area No / Route DBFO] describes the procedures and operational arrangements for the delivery of an effective Winter Service, to ensure safe passage for customers using the highway, and details the alert procedures and actions in the event of other Severe Weather. It is a mandatory requirement for the Service Provider to demonstrate their preparedness by developing this Severe Weather Plan. Instruction and contextual guidance to help the Service Provider compile the Severe Weather Plan is appended.

[Service Provider] will ensure the operational activities contained in this plan dovetail with other Highways Agency's Severe Weather Plans (e.g. Traffic Officer's Severe Weather Plan) and the Crisis Management Manual.

The document serves a number of specific purposes:

- Contract Document - The Severe Weather Plan outlines contractual responsibilities of the Highways Agency and their Service Provider.
- Quality Plan - The Severe Weather Plan forms part of Service Provider's quality or business management system.
- Contingency Plan - The Severe Weather Plan is linked with the Highways Agency's wider contingency arrangements.
- Operations Manual - The Severe Weather Plan describes the processes, procedures and operational arrangements for those responsible for delivering Winter Services and details the alert procedures and actions in the event of Severe Weather.
- Reference Document - The Severe Weather Plan is a comprehensive reference document.

1.1 Policy

It is the Highways Agency's policy to ensure, so far as is reasonably practicable, that safe passage on the Area Network is not endangered by snow or ice, and alert procedures and actions are taken to minimise risk to safe passage posed by fog, high temperatures, heavy rain and high winds.

1.1.1 Statement of service

[Service Provider] will endeavour to fulfil the Highways Agency's Severe Weather Requirement [within Area No / on the Route DBFO] in an efficient and safe manner.

1.1.2 Service performance requirement

The precautionary treatment level of service requirements are outlined in Section 6.1.1 and the snow clearance requirement is detailed in Section 6.1.2.

1.2 Risk periods

The year round weather service provided through HAWIS facilitates improved planning and warning for Severe Weather events. Certain weather types can be expected during particular risk periods, these are shown below for guidance. This does not absolve the Service Provider of the obligation to provide an appropriate service at any other time of the year if the need arises.

Weather Type	Risk Periods (months inclusive)
Snow, Ice and Freezing rain	October through to April
Heavy rain	January through to December
High winds (including Severe Gales and Storms)	September through to June
Fog	October through to January
High temperatures	June through to August

1.3 Service timetable

Key dates for the provision of reports and preparedness are summarised in the following table. *Service Provider to include any other relevant dates in the table.*

A checklist is provided in Appendix A.1.

Date	Who	Action
21 August	Service Provider	Submit Severe Weather Plan *hold point*
18 September	HA Service Manager HA National Winter & Severe Weather Team	Check and accept Severe Weather Plan
30 September		Operational Summer Period concludes
1 October		Operational Winter Period commences
Monthly from 15 October	Service Provider	Complete and submit Non warranty defect report spreadsheet
No later than end of October	Service Provider	Completion of Snow Desk exercises
No later than end of November	Service Provider	Completion of Severe Weather briefings
Between 1 December and 31 March	Service Provider	Include daily Vehicle Off Road (VOR) numbers on defect reports
by 18 December	Service Provider	Feedback and action planning from exercises and briefings
1 March	Service Provider	Review and update the Winter Service and Severe Weather infrastructure inventory database

30 April	Service Provider	Finalise list of lessons learnt (or update Severe Weather Action Plan (SWAP) to feed into the Operational Assessment Report
30 April		Operational Winter Period concludes
1 May		Operational Summer Period commences
May	Service Provider	Winter & Severe Weather review
31 May	Service Provider	Submit Salt Restocking Plan *hold point*
30 June	HA Service Manager HA National Winter & Severe Weather Team	Check and accept Salt Restocking Plan
June	Service Provider	Winter & Severe Weather report to HA (Operational Assessment Report)

1.4 Contractual arrangements

Winter Service duties including precautionary treatment, reactive treatment and snow clearance are the responsibility of [Service Provider].

Severe Weather duties including operational considerations, alert procedures and actions are the responsibility of [Service Provider].

1.5 Liability

Where arrangements are made with other service providers or Highway Authorities for Winter Service provision and Severe Weather actions to be provided by them on the [Area Network / Network / Project Road], it is the responsibility of [Service Provider] to ensure such service has been carried out. Arrangements made do not absolve the Service Provider's obligations.

1.6 Area Network / Network / Project Road

1.6.1 Description of [Area Network / Network / Project Road]

The Service Provider to include a description of their [Area Network / Network / Project Road] including general details or features that may impact on Winter Service operations and areas most likely to be affected by Severe Weather.

1.6.2 Extent of Area Network

The extent of [Area Network / Network / Project Road] covered by this plan is shown in the following table and also detailed in the Area Map at Appendix A.2 The key interfaces are defined in the interface drawings which are included within Appendix A.3.

Service Provider to include details of [Area Network / Network / Project Road]

Extent of [Area Network / Network / Project Road]		
Road	Extent	Length (km)
[A999]	From [x] to [y]	

Service Provider to include details of sections of three lane or more carriageway. Where none exist a positive statement to that effect should be included here.

Sections of three lane or more carriageway		
Road	Extent	Number of lanes
[A999]	From [x] to [y]	

Service Provider to include details of footway and cycle track routes to be treated. Where none exist a positive statement to that effect should be included here.

Footway and cycle track routes				
Category	From	To	Route Description	Map ID
[1a]				

Where routes adjoin Local Highway Authority footways their categorisation should be adopted, otherwise routes should be categorised appropriately in accordance with the 'Well Maintained Highways – Code of Practice for Highway Maintenance Management'. There is no need to detail those at category 4 as this will simply be the remainder of the network. Maps should be included at Appendix A.2 and appropriate cross references included in the above table.

1.6.3 [Area Network / Network / Project Road] Features

[Service Provider] has identified the following network features that require special consideration with regard to weather within the [Area Network / Network / Project Road], and features that occur at boundary interfaces. Details of each Network Feature are contained in Appendix A.4.

The Service Provider to identify features and record details in Appendix A.4.

1.6.4 Vulnerable locations

Certain locations on the network are particularly vulnerable to severe weather conditions. In addition there are a number of locations where although problems may not have actually occurred, due to a number of factors they may be at increased risk of suffering problems during a severe weather event. These vulnerable locations (or trouble spots) requiring special consideration and mitigation measures within the [Area Network / Network / Project Road] include:

- *parts of the network at high altitude;*
- diversion routes that may be affected by severe weather;
- *areas prone to low temperature/low humidity conditions where special measures may be required;*
- *sections of road of a gradient or road radii that may result in problems in certain conditions e.g. jack knifed lorries or HGVs failing to gain traction;*
- *areas commonly prone to climatic conditions such as strong cross winds that would result in snow drifting, localised heavy snow patterns and overturned vehicles;*
- *parts of the network at risk of flooding resulting in lane/road closures;*
- *any structures where differential treatments or special measures may be required;*
- *low temperature, low humidity problem spots require mapping as these may require additional treatments;*
- *areas where, from experience, particular problems arise where the service provision can be hampered, including traffic calming areas;*
- *major transport hubs e.g. Heathrow Airport, Port of Dover etc.; (This inclusion is mandatory, with a requirement to identify all major transport hubs and any special measures to be implemented during severe weather);*
- *areas of the network prone to accidents.*

The following table shows the location and brief key word summary of the problem. Each is cross referenced to detailed individual site mitigation plans contained within Appendix A.5. These must be reviewed at a minimum annually.

Vulnerable Locations		
Location	**Reference** *To individual mitigation plan*	**Problem (very brief summary)**
[Road No. and marker post]		

2 ROLES AND RESPONSIBILITIES

[Service Provider] is responsible for providing suitably trained and competent staff for the designated roles for delivery of a Severe Weather Service on the [Area Network / Network / Project Road].

2.1 Key Personnel

The following table identifies the key personnel responsible for delivery of the services defined within this document.

Function	Title	Name
Network Manager		
Duty Officer		
Decision Maker		

The above table should be completed to include all relevant Service Provider personnel. Where possible, consistency of naming should be maintained. The table should include the person with overall responsibility (Network Manager), the person who has day to day responsibility for Winter Service/Severe Weather and would be the first point of contact (Duty Officer) and the person responsible for monitoring weather forecasts and road conditions and making decisions (Decision Maker). These functions are likely to have different titles within each organisation. Add any other key personnel required for the successful delivery of the service.

2.1.1 Decision Maker

Service Provider to include details of the decision maker(s) e.g. Duty Officer and definition of the role(s).

2.1.2 Duty Rota

Service Provider to include duty rotas for all personnel involved in winter service and severe weather operations.

The Decision Maker Duty Rota is included at Appendix A.6.

2.1.3 Organogram

Service Provider to include an organogram detailing the management structure for the delivery of Severe Weather services.

2.2 Staffing levels

[Service Provider] has [number] qualified drivers for Winter Service operations on the [Area No/Route DBFO] network. This has been assessed by [Service Provider] and considered sufficient to meet the Highways Agency's AMOR requirement to provide an effective Winter Service*.

** Change where applicable depending upon specific form of contract.*

Service Provider to include detail of the number of staff available for the various Winter Service operations, including the operatives to drive the Winter Service Vehicles, detailing any sub-contracted staff. This can be in a table format.

Operatives are listed at Appendix A.7.

Service Provider to include detail of contingency plans to address any potential staffing issues. Include procedures for mobilising reserve staff.

AMOR Service Provider to include evidence that the proposed staffing levels and competency are sufficient to deliver an effective Winter Service, including planned precautionary, snow clearance, continuous treatment and freezing rain.

Service Provider to include a general statement detailing the procedures in place for the provision of staff to action Severe Weather events, including use of sub-contract staff where appropriate.

2.2.1 Training

Service Provider to include a general statement on training (including staff development and refresher training) together with details of qualification standards for drivers, supervisors, depot supervisors and decision makers. Reference to training on this plan should be included.

Training Records are detailed at Appendix A.8.

2.3 Health and Safety

Service Provider to include a statement on Health and Safety covering the operational aspects of Severe Weather and Winter Service e.g. treatment speed, ploughing, loading and off-loading, manning levels, Personal Protective Equipment (PPE), welfare, rations, communications and the safety of other road users.

Risk assessments must be undertaken by Service Providers to ensure the practices expected of operatives and other members of staff on the Network in such conditions as freezing rain are adequately recognised. Completed risk assessments are included within Appendix A.9 for the benefit of others, e.g. Traffic Officer Service.

2.4 Command and control process

Service Provider to include a detailed description of the process including forecast, decision, instruction, treatment, monitoring loop and command and control arrangements for both Winter Service and Severe Weather events. (Use of a flowchart process diagram is considered best practice).

Operational procedures detailed in this Severe Weather Plan will be tested through a Severe Weather Desk exercise. [Service Provider] will plan and execute a Severe Weather Desk exercise prior to the Operational Winter Period to test the delivery and resilience of the Severe Weather Plan and identify areas for improvement. Planning for the exercise must be in consultation with the Service Manager, Emergency Planning Managers and the Winter & Severe Weather Team to ensure critical and vulnerable points in the service are tested (Appendix B.2).

3 LIAISON AND ARRANGEMENTS

This section of the Severe Weather Plan contains [Service Provider's] arrangements for liaison and co-operation with key stakeholders to promote delivery of a consistent and co-ordinated service.

Service Provider to include area specific introduction as appropriate.

[Service Provider] will hold Severe Weather briefing sessions prior to the end of November to ensure the relevant stakeholders are fully briefed. Feedback and actions will be reported to the National Winter and Severe Weather Team as per the service timetable (Section 1.3). *An example attendance register and summary of actions template are contained in Appendix B.2.*

3.1 Liaison

The management of the [Area Network / Network / Project Road] and the interface with other networks is essential to the consistent provision of Winter Service and actions in the event of Severe Weather. Liaison with Traffic Management Directorate (TMD) is also important to provide up to date customer-facing functions such as traffic information, active management of traffic flows and incident response.

3.1.1 Internal communication arrangements

[Service Provider] will provide and maintain an effective telecommunications system between the Service Manager, the Service Provider's supervisory staff and operational vehicles. Mobile telephone communication must not be relied upon since these can become overloaded particularly during extreme conditions, or in the event of an incident causing major congestion.

When considering the provision of a dedicated telephone number, the Service Provider must consider combining this with other requirements such as those in connection with incident management. Substantial operational benefits can be obtained by providing a permanently manned control centre to co-ordinate the Service Provider's work.

The communication system for all Winter Service Vehicles and the back-up communication system for all Winter Service Vehicles include.

Internal communication is by [radio/cellular telephone/Airwave].

The arrangements for backup communications are [details].

Service Provider to give details of internal communication arrangements including contingency arrangements.

A comprehensive internal contact list can be found in Appendix A.10.

3.1.2 External communication arrangements

The Service Provider must discuss with appropriate stakeholders including adjacent authorities and private network managers (including motorway service areas, airport / rail roads) to agree management arrangements. As part of these discussions the Service Provider must highlight parts of other networks that are important to its operational effectiveness and that of the Highways Agency.

[Service Provider] has established clear lines of communication and agreed contact names and numbers to ensure communication is possible at all times.

The following table indicates the contacts of stakeholders who are important to [Service Provider's] operational effectiveness.

Road	Location	Contact
[A999]	[e.g. junction / exit]	[stakeholder]

A comprehensive external contact list can be found in Appendix A.11.

3.1.3 Liaison with major highway schemes

Service Provider to include advanced notification of any major highway schemes within the [Area Network / Network / Project Road] *and contacts for any such schemes in the table below. Traffic Management must be designed with consideration to Winter Service to maintain continuity of winter treatments and any Severe Weather procedures and actions.*

Road	Location (e.g. junction to junction)	Type of scheme	Contact
[A999]			

3.1.4 Media liaison

In order to facilitate media liaison [Service Provider] must make available to the Service Manager and/or Highways Agency Press Officers such information as requested. Direct liaison with the media must only take place when directed by the Service Manager.

3.2 Agreements

3.2.1 Mutual aid agreements

Mutual aid is where one service provider may have a resource issue, a second or third (etc.) service provider will assist in delivering the same goal. Mutual aid can be, from the sharing of resources such as salt, the sharing of facilities that may provide improved resilience of the [Area Network / Network / Project Road], or the provision of a full Winter Service to a particular part of another network. For example, there are local roads that service providers may treat to ensure their own operational effectiveness such as access routes to depots.

It can also be used to provide support to, or obtain support from, other network operators during times of stress, such as during Severe Weather, to the benefit of the road users. The provision of support at such times and capabilities of provision should be discussed and contact details agreed.

Service Provider to include a statement explaining what mutual aid arrangements are in place, including contact details.

[Service Provider] will document all requests for support from, or to, other operators and the subsequent decisions, with reasons, by completing the Mutual Aid Agreement forms. Completed forms can be found in Appendix A.12 *(an electronic version of the template is available from the Service Manager)*.

[Service Provider] will submit signed copies of completed forms to the Service Manager with additional copies issued to the provider/recipient of mutual aid. It is noted that mutual aid arrangements do not absolve [Service Provider's] obligations.

3.2.2 Cross boundary agreements

[Service Provider] will ensure the cross boundary agreements are in place at the interface of the [Area Network / Network / Project Road] and adjacent networks to ensure a consistent service that will not leave potentially important sections of either network untreated.

Service Provider to include a statement explaining what cross boundary agreements are in place with adjacent Highway Authorities and Service Providers to maintain continuity with all winter treatments and any Severe Weather procedures and actions.

Agreements to include road, location (extent) and timing (particularly relevant when considering access to depots) of service.

3.3 Vehicle arrangements

3.3.1 Abandoned vehicle arrangements

Wherever possible the owners of abandoned vehicles will be contacted and requested to remove the vehicles, but where this is not possible, the specific details of the vehicles, its location and the reason why it needs to be moved will be provided to the Police / Traffic Officer / National Vehicle Recovery Manager (NVRM) and a log of all communications kept. The NVRM will provide an end-to-end vehicle recovery service. **[Service Provider] must only move vehicles once an instruction from a Police/Traffic Officer has been received for each vehicle.**

Where owners do leave their information, details will be obtained by [Service Provider] and lodged with the Severe Weather Desk, NTOC and RCC.

Service Provider to include details of arrangements for moving vehicles including equipment to be used, procedures to be followed and contact details for relevant organisations and supply chain.

3.3.2 Incidents involving Winter Service Vehicles

Any incident involving [the Highways Agency's own vehicles / any Winter Service Vehicle] will be reported to the Service Manager and the National Winter Specialist. The report must be made on form HA 20001 and must be submitted as soon as possible but no later than before 0900 hours the following working day. Where the accident involves a fatality or serious injury the report must be made immediately.

Service Provider to amend the above text to match contractual requirements. Where there is no contractual requirement in respect of Service Provider's vehicles, details for report should still be included.

3.4 Escalation arrangements

3.4.1 Highways Agency's Crisis Management Manual

The Crisis Management Manual (CMM) provides guidance on managing the Highways Agency's response to crises and emergencies. Severe weather events make up a significant proportion of the events that trigger the CMM escalation steps. The five stages of escalation are as follows:

Routine Operations – HA and service provider resources respond to incidents following standard procedures. Weather forecast and warning services would be continuously monitored and if anything shows up escalation would be considered. If service providers become aware of emerging resilience threats they should inform the Agency immediately.

Regional Alert (RA) – when a significant weather event is expected that potentially could cause disruption on the network a regional alert would be declared. Monitoring will be heightened and telephone conferences will take place to ensure we are as prepared as possible prior to the arrival of the forecast weather. Service providers will be required to provide information and to

dial into telephone conferences in line with normal expectations. The regional alert process does not change responsibilities within each service type (i.e. service responders will remain fully responsible for managing and delivering their own service), but will act to better coordinate the individual responses to ensure a more effective combined response as well as to provide the most accurate information to road users.

Regional Crisis – if the SRN is severely affected where sections of the network are closed or road users have become trapped, and are likely to be so for some time or overnight, a Regional Crisis is likely to be declared. The profile of the event is thus raised, a more senior commander will be appointed and the event will be more visible both inside and outside the Agency. During this stage information reporting and the need to dial-in to or attend meetings will be similar to a RA although possibly at an increased frequency but still in line with normal expectations.

National Alert – when more than one region is at Regional Crisis or in advance of a widespread severe weather event the Agency is likely to declare a National Alert. This facilitates coordination across regions as well as providing an accurate national picture of network conditions to inform road users, DfT and maybe Ministers. Service provider activity would be the same as during a Regional Crisis which would still be operating in the region.

National Crisis – this is for the most extreme of events and incidents. As with a National Alert, service provider activity would be the same as during a Regional Crisis.

A key component in the success of any response is accurate and timely information. Service Providers must have appropriate processes to continuously monitor and manage the effectiveness of their severe weather service. During a severe weather event Service Providers must be able to provide real time network performance and service delivery intelligence and information to support the incident coordination process to enable informed appropriate decisions to be made by HA commander.

During a severe weather event conditions may deteriorate to a point where the continuous and safe operation of the network may be placed at risk. The CMM processes will facilitate an early identification of a potential interruption to the network operation with appropriate responses triggered. Any decision to close a route during severe weather should only be made by the identified HA commander at the time.

Service Provider to define escalation arrangements including specific details of how the establishment of the Severe Weather Desk (Section 3.4.3) and activation of the Contingency Plans (Section 3.4.2) are related. Service Provider to identify process for providing information to support the Crisis Management Manual requirements.

3.4.2 Activation of Contingency Plan

This [title] Contingency Plan must be activated when a staff member becomes aware of a major or critical incident taking place and they must immediately put in place the actions outlined within the contingency plan.

Service Provider to include a description of procedures for the activation of contingency plan.

3.4.3 Severe Weather Desk establishment

The Severe Weather Desk must be established prior to the forecasted commencement of Severe Weather that could cause disruption to the [Area Network / Network / Project Road] or as soon as possible in the event of un-forecast Severe Weather.

The Severe Weather Desk will be established at [location].

The Severe Weather Desk/control room will have the ability to communicate directly with motoring organisations and local authorities and to listen to/watch local news/traffic media.

Where decisions, and their implications, require strategic oversight they will be referred to the Service Manager.

The Severe Weather Desk Duty Rota is included at Appendix A.13.

Service Provider to provide a detailed description of the Severe Weather Desk arrangements including preparation, establishment and operation. Where applicable, Service Provider to include details of any proposals for enhanced monitoring of weather and network conditions in advance of a severe weather desk being established (sometimes referred to as a "shadow severe weather desk").

3.5 Weather information

The Highways Agency Weather Information Service (HAWIS) has been developed to provide weather forecasts, the continuous monitoring of actual conditions year round to facilitate winter service operations and support the resilient management of the network during severe weather events. HAWIS obtains environmental weather condition data from meteorological Environmental Sensor Stations (ESS) located on the [Area Network / Network / Project Road]. The service is procured by the Highways Agency through the following contracts:

- Highways Agency Weather Central Service (HAWCS)
- Environmental Sensor Station Supply Framework (ESS Supply)
- Environmental Sensor Station Maintenance and Installation (TechMAC / Regional Technology Maintenance Contractor (RTMC))
- Environmental Sensor Station Communication (NRTS)
- National Weather Forecasts (National Forecast Provider)
- Service Provider Weather Forecasts (MAC/ASC)

The HAWIS website can be accessed at https://hawcs.dft.gov.uk

Service Providers are only responsible for the provision of their own weather forecasts.

[Service Provider] has appointed [Forecast Provider] to provide the forecast requirement detailed in Appendix B.3.

Service Provider to include alerts/forecasts that will be used to provide early warning of forecast Severe Weather (i.e. EA Flood Watch/Warning, weather forecast etc.)

Faults on HAWIS must be reported as soon as possible to the appropriate maintenance contractor. Contact details can be found in Appendix A.11.

3.5.1 National Domain Network of Environmental Sensor Stations

The domain map is shown below.

Service Provider to include domain map

Service Provider to indicate any consideration for further Environmental Sensor Stations (ESS) including the location and the reason for such additional sites. Note: The decision on where to site the new ESS rests with the Service Provider, and should follow the consultation and approval process through the HAWIS ESS Service Manager and ESS Supply Framework Board.

3.5.2 Domain arrangements

Domain arrangements are described in the following table and detailed on the Area Map in Appendix A.2.

Domain	Outstations	Routes

4 REPORTING

4.1 Winter reporting

[Service Provider] will notify the Highways Agency, [Forecast Provider], police, adjacent Service Providers, NTOC Embedded Forecaster and local highway authorities [others?] of all proposed Winter Service treatments.

[Service Provider] will, as soon as practicable, notify the Highways Agency, [Forecast Provider], police, adjacent Service Providers, NTOC Embedded Forecaster and local highway authorities [others?] of other actions including changes to proposed treatments.

The Winter Reporting Form (WRF1) system, provided by the Highways Agency, will be used throughout the Operational Winter Period for the above notifications and for confirmation of treatments. The WRF1 system must be kept up to date with plant, salt and fuel resilience to ensure a true and accurate representation of the current situation.

The internet based reporting system is at http://winter.atkinsglobal.com/winter. A backup service is available at http://78.40.241.12/winter. In case of failure of the internet based facilities standard forms at Appendix A.14 will be used to fax the reports to the backup fax number (0121 678 8569).

The Service Provider will detail the acquired user access to the WRF1 system and indicate competency in using the system (e.g. previous experience, training received etc.). Training is available to all users of the system on request.

WRF1 reporting will include as a minimum:

- Daily updates by 10:00 hours with salt stock capability, Area Operational Reserve Winter Service Vehicle levels, and fuel status, where there is a possibility of fuel disruption. Additional reports submitted in the event of a change to salt stock capability, status of fuel levels or in the event of an Area Operational Reserve vehicle being used or relocated.
- A “Full” or “No Action” report submitted by 1600 hours each day which details the proposed actions to be undertaken in the following 24 hour period. However, where a decision was made after 1600 hours or a previous decision was changed, the appropriate report must be submitted within 30 minutes of a decision, and no later than the proposed start time of the treatment.
- A “Previous Action” report to confirm all the actions undertaken since the submission of the last “Full” or “No Action” report. This daily report(s) must be submitted by 1000 hours on the following day, but, where possible, submitted within 30 minutes of the treatment being completed.
- An hourly update, when Severe Weather Desk is in operation.

[Service Provider] will monitor salt stocks (and stocks of other appropriate materials) regularly during the Operational Winter Period and report using the WRF1 electronic reporting system.

4.2 Severe Weather reporting

[Service Provider] will notify the Highways Agency, [Forecast Provider], police, adjacent Service Providers, NTOC Embedded Forecaster and local highway authorities [others?] of all proposed actions.

Service Provider to include details of reporting procedures for Severe Weather events, including reporting structure and times.

[Service Provider] will report the number of Severe Weather events that required treatment/actions within the [Area Network / Network / Project Road].

4.3 Additional reporting

[Service Provider] will report on thermal mapping [as required].

The report on thermal mapping to include any changes adjacent to and on the [Area Network / Network / Project Road] which will affect the Highways Agency's thermal mapping information, review coverage of thermal maps, and identify areas of improvement.

[Service Provider] will submit details of all non warranty defects and maintenance for the Highways Agency's winter fleet vehicles for the previous calendar month by the 15th of each month. Submissions will be made using the spreadsheet available from the National Winter & Severe Weather Team.

[Service Provider] will submit vehicle off road (VOR) figures on defect reports for all HA owned winter fleets, to the National Winter & Severe Weather Team. Template spreadsheets are available from the National Winter & Severe Weather Team.

[Service Provider] will submit an Operational Assessment Report as stipulated in the Service Timetable in Section 1.3.

Service Provider to obtain template from Service Manager, this report was previously known as the end of season review.

Back up reporting forms can be found in Appendix A.14.

Reports will be used for hot and cold de-briefs, as part of developing new research programmes, or identifying areas for review, as part of the lessons learnt process, therefore it is essential that the information is complete and accurate.

4.4 Records

Collection of good quality records covering decisions made together with reasons, and advice and information provided is fundamental especially to defend against liability claims made in respect of Winter Service and any actions taken in the case of Severe Weather.

Service Provider to demonstrate that relevant records are retained for the following, state retention period and storage media (refer to individual contracts for details):

- *Weather forecasts;*
- *Actual weather conditions;*
- *Reports received;*
- *Decisions made;*
- *Instructions made;*
- *Actions taken;*
- *Liaison and communications log;*
- *Telephone conversations including with forecast provider;*
- *Material usage;*
- *Fleet breakdowns;*
- *Vehicle datalogging records - Times taken to complete treatments/actions; This includes the archiving/saving of Service Provider Summary reports, HA Gritting Detailed reports, and HA Gritting Summary reports as generated by the Masternaut datalogging system.*
- *Use of additional resources (including reserve Winter Service Vehicles and mutual aid);*
- *Road closures/blockages due to weather conditions;*

- *Complaints received relating to conditions due to weather;*
- *End of season records (e.g. accuracy of weather information, lessons learnt or Severe Weather Action Plan (SWAP).*

Records to be available for inspection in accordance with individual contracts.

Some of the issues, and subsequent actions identified or taken and lessons learnt may be captured as part of a lessons learnt document or Severe Weather Action Plan (SWAP). These would be used as a key document to complete the review recorded below.

4.5 Review

Service Provider to include details of review procedures, including responsibility and criteria for review e.g. failure to achieve required outcome, continuous improvement initiatives and Operational Assessment Report.

Typical issues for the review may include:

- *response and treatment times;*
- *decision making;*
- *command and control;*
- *escalation and Severe Weather Desk;*
- *liaison and communications;*
- *weather forecasting and ice prediction;*
- *actual weather conditions;*
- *operational issues;*
- *records;*
- *health and safety;*
- *human resources;*
- *vehicles and plant;*
- *anti / de-icing materials;*
- *compounds and facilities;*
- *other issues e.g. traffic flow, adjacent roads etc.;*
- *areas for improvement;*
- *Identified vulnerable locations on the network.*

5 MATERIALS, STORAGE AND VEHICLES

This section of the Severe Weather Plan contains details of the resources available for delivery of a Severe Weather Service on the [Area No/Route DBFO] [Area Network / Network / Project Road] including reserve / contingency arrangements.

The Highways Agency will make available compounds, vehicles, plant and equipment as appropriate to the form of contractual arrangement and may make available additional reserve resources if the Service Provider requires them due to breakdowns or operational difficulties.

[Service Provider] is responsible for providing the other resources including staff, materials, and brine production equipment and storage.

[Service Provider] is responsible for preparing and ensuring all compounds, equipment and plant operate efficiently.

Service Provider to include area specific introduction as appropriate.

5.1 Compounds and facilities

An inventory relating to [Service Provider's] compounds and the Area Operational Winter Service Vehicles (including Operational Reserve) plus National Reserve Winter Service Vehicles is stored on an MS Access database held by the Highways Agency. This inventory requires periodic updates to reflect any changes.

[Service Provider] will review and update the MS Access database inventory at intervals set out in the Service Timetable in Section 1.3.

5.1.1 Compounds

Details of compounds, depots and other facilities covering the [Area Network / Network / Project Road] network are provided in the compounds, depots and facilities schedule at Appendix A.15.

5.1.2 Fuel

The fuel type (including grade) and details of supply and storage arrangements including minimum stock levels and supply contingency and pump maintenance arrangements are detailed at Appendix A.16.

[Service Provider] will monitor fuel stock levels regularly during the Operational Winter Period and report using the WRF1 system as per requirements in Section 4.1.

5.2 Treatment Materials

Contextual guidance on treatment materials including storage are contained in Appendix B.4.

[Service Provider] will utilise the following de-icing/anti-icing materials to deliver an effective Winter Service on the [Area No/Route DBFO] network.

Service Provider to list all the materials to be used on the [Area Network / Network / Project Road], including details and reasons for their selection.

- 6mm down salt to BS3247: 2011,
- *brine solution with an optimum and maximum sodium chloride concentration of 23% and no less than 20%,*
- *marine salt,*
- *8-10 mm salt,*
- *agricultural by product (ABP) treated salt,*

- *potassium acetate,*
- *6-8mm sharp sand,*
- *calcium chloride,*
- *calcium magnesium acetate,*
- *propylene glycol,*
- *potassium formate,*
- *other.*

Service Provider to include a statement to indicate that they have considered the cost and environmental effects when selecting the usually more expensive specialist materials and indicate specific circumstances for use. See National Winter Service Research Group's (NWSRG) "Treatments for Extreme Cold" section of Practical Guide for Winter Service Delivery.

5.2.1 Material storage and brine production

Service Provider to include details of storage locations and facilities (including brine production). A reference to Appendix A.15 should be included. Where defined supply profiles are used, these should be included. Service Provider to include a separate table (example below) for each material used.

Material *(salt / brine / ABP / potassium acetate / $CaCl_2$ / $MgCl_2$ etc.)*			
Location	Type	Capacity (tonnes or litres)	Min (tonnes or litres)
	(barn / open) *(saturator / storage only)*		

Service Provider to also include details of locations of salt heaps and salt bins

Service Provider to include statement on the suitability of the storage (including handling), to prevent contamination and degradation of the materials, to ensure they remain effective and do not create a hazard. This should include arrangements to ensure that any brine produced remains within the optimal range.

5.2.2 Salt management

[Service Provider] will develop and submit a Salt Restocking Plan (Service Timetable Section 1.3), providing evidence for supply arrangements, including a recommended Reporting Threshold profile (with supporting evidence). Service Providers should review this in line with the Minimum Contractual Salt Stock Levels (Appendix B.4). A template for Service Providers to complete is contained in Appendix A.17.

The Salt Restocking Plan is to be submitted by 31st May.

Service Provider to define Reporting Threshold profiles for salt stocks (and stocks of other appropriate material) taking into consideration local circumstances and other known risks to stock supplies. The reporting threshold will be the threshold for the automatic ordering of additional stock. Attention is drawn to Minimum Contractual Salt Stock Levels, these levels will be reviewed for acceptance by the Service Manager.

5.2.3 Supply arrangements

Service Provider to include details of supply arrangements including a primary and secondary supplier. Detailed evidence must be given to confirm the contract with the supplier(s) is/are in place and that materials can be sourced in a timely manner.

Details of stock control arrangements to ensure continuous holding of appropriate stock, including alternative treatment materials, must also be documented (refer to Minimum Contractual Salt Stock Levels in Appendix B.4).

Service Provider to include details of the re-supply arrangements for salt heaps and salt bins.

The Service Provider should use the Re-stocking plan template in Appendix A.17 to document all salt supply arrangements.

5.2.4 Reserve and contingency arrangements

Service Provider to include details of reserve treatment material arrangements. Details of contingency supply should also be specified including details of alternative suppliers and reference to mutual aid arrangements with other service providers or Local Highway Authorities.

The Service Provider should use the Re-stocking plan template in Appendix A.17 to document all reserve/contingency salt supply arrangements.

5.3 Vehicles and Plant

[Service Provider] has in total [number from table in Appendix B.5] Winter Service Vehicles (including Operational Reserve Vehicles) available for use of which [number] have been allocated as Operational Winter Service Vehicles to cover the planned precautionary Winter Service Routes. [Number of vehicles from table] vehicles are designated as Operational Reserve Vehicles as detailed in Section 5.3.1.

In addition to the Area Operational Winter Service Vehicles, a further [number from table in Appendix B.5] vehicles, which form part of the complement of Winter Service Vehicles within the Area are designated as National Reserve Vehicles. Special conditions, as set out in Appendix B.5, attach to their usage.

Snow Blowers are additional to the Area Operational Winter Service Vehicles, within [Area], [number of vehicles] are available for use. [Service Provider] will adopt the procedures for Operational Reserve Vehicles in relation to their use. *State the number of Operational Reserve Vehicles estimated to cope with an area wide snow event.*

Service Provider to include a statement to indicate the provision of Service Provider's own vehicles and plant where appropriate.

Service Provider to include details for any specialised equipment (e.g. specialist mixing equipment for alternative anti-icing/de-icing material) and other equipment (e.g. loading hoppers and weighbridges) as appropriate including arrangements for maintenance.

Service Provider to include a statement to indicate additional resources to be made available for use on footways and cycle tracks where appropriate. Where this is not the case a positive statement to that effect should be included.

The schedules of vehicles, plant and equipment are provided in Appendix A.18.

5.3.1 Operational Reserve Winter Service Vehicle and contingency arrangements

[Service Provider] can use the Area Operational Reserve Winter Service Vehicles allocated to their [Area Network / Network / Project Road] without prior approval but must ensure the use is notified up to [an agreed predetermined level]. National procedures for management of the both

Operational Reserve Winter Service Vehicles and National Reserve Vehicles are in Appendix B.5.

Service Provider to include detailed arrangements and procedures for the use of reserve Winter Service Vehicles including details of arrangements for transporting vehicles between compounds.

The number of Area Operational Reserve Winter Service Vehicles and the agreed Reserve Threshold trigger level is provided in the table below.

Service Provider to agree the Reserve Threshold level for their [Area Network / Network / Project Road] with the Service Manager prior to the start of the Operational Winter Period. Populate the table below and include other relevant details as appropriate.

Reserve Vehicles	**Area X**
Number of Operational Reserve Vehicles	Enter No
Reserve Threshold – Number utilized	Enter No

Service Provider to include details of contingency plans to address any potential issues.

5.3.2 Vehicle maintenance arrangements

[Service Provider] will maintain vehicles in accordance with [ASC Service Information Annex 7 / MAC contract Annex 7 / DBFO specified].* delete as applicable

Service Provider to include details of maintenance arrangements for both Highways Agency and Service Provider vehicles. Arrangements should detail who provides maintenance services, how these services are managed with appropriate references to the internal and external contact lists (Appendices A.10 and A.11).

Maintenance arrangements to include painting of vehicles and wash down following treatment.

[Service Provider] will rotate the use of Operational and Reserve Winter Service Vehicles, irrespective of type, to balance usage.

5.3.3 Vehicle breakdown and recovery arrangements

Service Provider to include details of breakdown and recovery arrangements in place for both Highways Agency and Service Provider vehicles. This should detail who provides the service and how these services are managed with appropriate references to the internal and external contact list (Appendices A.10 and A.11).

The provider(s) of the service must be capable of undertaking all aspects of vehicle recovery and roadside repair to the vehicles.

5.3.4 Vehicle Preparation

Service Provider to include details of vehicle preparation arrangements including checks and calibration for full operational use, and checks on fitting and removing of ploughs to all vehicles so equipped.

As a minimum spread calibration to be undertaken pre-season and on change of treatment material. For more information see NWSRG 2011 Winter Service Best Practice Guide on Calibration.

The method of notification to Service Manager should also be included.

5.3.5 Arrangements with supply chain partners

Service Provider to include details of any supply chain partner arrangements.

6 WINTER SERVICE ROUTE PLANNING

This section of the Severe Weather Plan contains details on [Service Provider's] Winter Service Routes (WSR) for use in the delivery of Winter Service on the [Area No/Route DBFO] Network.

Service Provider to include area specific introduction as appropriate.

[Service Provider] will plan, design and continually review the WSR to ensure they are optimised to be as efficient as possible in terms of treatment lengths and time to undertake treatment.

An effective Winter Service can respond to a change in the forecast in a timely manner. For this reason the initial response is defined as the maximum permitted time taken from the decision to treat until the Winter Service Vehicles are loaded, staffed and ready to leave the depot.

Initial response time is 1 hour

Precautionary treatment is most effective when carried in out advance of and as close to forecast freezing time (to minimise the loss of salt due to trafficking). Therefore, the precautionary treatment and turnaround time is defined as the maximum permitted time for the following cycle: leaving the depot, treating the route, returning to a depot and being ready to leave the depot for the next treatment.

The AMOR requirement for Precautionary Treatment and Turnaround time is 3 hours*

** Change as applicable depending upon specific form of contract.*

6.1 Winter Service Route design

[Service Provider] will liaise closely with adjacent Highway Authorities and other stakeholders when designing WSR for precautionary and reactive treatment to ensure consistency and continuity of Winter Service operations on all sections of the [Area Network / Network / Project Road] and with adjacent highway networks, including footways and cycle tracks.

For hard shoulder, carriageway marginal strips or emergency refuge areas anti-icing/de-icing material coverage should be 50% at the full rate of spread. The Service Provider should give consideration to the creation of a simple database of start and finish times to enable reports to be quickly generated and provided as required by the Service Manager. Designs of WSR for anti-icing/de-icing precautionary treatment, should allow for full coverage of the specified or instructed rate of spread of anti-icing/de-icing materials over the full width of all areas of carriageway, including LBS1 of a Smart Motorway.

[Service Provider] will take into consideration the impact from the following, where applicable, when designing the WSR (not exhaustive):

- Physical constraints such as tunnels, over bridges, operations near railways, solid vertical barriers, geometry and traffic calming areas;
- Potential need for different requirements on different lanes of the carriageway;
- Need for variation in anti-icing/de-icing material, application frequency, spread rates, spread patterns, free running and wastage factors;
- Major schemes;
- Route classification;
- Smart Motorways with hard shoulder running;
- Network Features;

- Vulnerable locations;
- Depot constraints– such as a number of routes operating from one site, restrictions this might place on the reloading operation and the time needed to achieve the requirements.
- Depot access problems due to localised congestion caused by severe weather;
- Variation in traffic flow;
- Poor weather conditions; and
- Carrying snowplough blades on precautionary treatment runs.

Service Provider to use computer software as it can significantly improve WSR optimisation and allow for adjustments to WSR to be made quickly and easily while maintaining a high level of efficiency. This is particularly effective if short-term changes occur such as temporary road closures or other traffic management.

Service Provider to design WSR for precautionary treatment of carriageways, allowing for full coverage of the specified or instructed rate of spread of anti-icing/de-icing materials over the full width of all areas of carriageway. For hard shoulder (on non Smart Motorway sections) or carriageway marginal strips anti-icing/de-icing material coverage must be 50% of the width at a full rate of spread.

Service Providers will design routes to ensure that no gap in treatments between route or network boundaries can occur.

Service Providers must consider providing a schedule covering winter maintenance depot business continuity, covering the approach to be taken when experiencing conditions recorded in the last two points above. Consideration should be made as to how winter service routes will be maintained when a depot becomes unavailable, but the allocated fleet is available, and for instances where neither the depot facility, or its allocated fleet is available.

6.1.1 Precautionary treatment routes

[Service Provider] has designed WSR for planned precautionary treatments to meet the precautionary treatment requirement (detailed in the following table). The target treatment time for each route and turnaround time is stated on the route schedule and drawing (Appendix A.19). *The precautionary treatment and turnaround time stated by the Service Provider (to include leaving the depot, treating the route, returning to a depot and being ready to leave the depot ready for the next treatment) will be used as a metric.*

Precautionary treatment on Smart Motorways may be undertaken directly:

- from LBS1 when LBS1 open to traffic,
- asymmetrically from LBS2, or
- from LBS1, at reduced speed, when LBS1 closed to traffic.

Precautionary treatment requirement			
Route classification	Red	Amber	Green
Criteria	All lanes (including slip roads) to be kept clear of ice, as far as reasonably practicable		

6.1.2 Reactive Treatments / Snow clearance routes

Reactive treatments or snow clearance can take longer than precautionary treatment, therefore snow routes have been designed to achieve the clearance requirement detailed in the following table and mitigate excessive driver hours. The snow clearance plan should be coordinated with the RCC and care taken to ensure consistency across boundaries between Service Providers.

Service Provider to design reactive treatment / snow routes to ensure an efficient delivery of the Winter Service in accordance with the contractual requirements stated in the table below.

Service Provider to present a plan for managing an area wide snow event, utilising all available operational or operational reserve winter service vehicles including any non-Highways Agency owned Extra Effort Vehicles it has available.

Snow clearance requirement							
Route classification	Red		Amber		Green		Slip and link roads
Number of existing lanes	1 or 2	3 or more	1 or 2	3 or more	1 or 2	3 or more	Not applicable
Criteria	minimum number of lanes to be kept clear of snow, as far as reasonably practicable						
Between the hours of 06:00 - 20:00	1	2	1	2	1	1	1
Between the hours of 20:00 - 06:00	1	2	1	1	1	1	1
Following the cessation of snow all lanes are to be clear of snow within	12 hours		18 hours		24 hours		In accordance with route classification

6.2 Winter Service Route summary

Summary of WSR for carriageways, footways, cycle tracks and other such areas used by pedestrians and cyclists is provided in the following table.

Service Provider to include a summary of WSR for carriageways including for each WSR its route reference, domain, route description, overall length and target treatment time. Separate tables should be used, where appropriate, if different WSR are used for the different treatment regimes. Where Service Providers have identified any supplementary high level routes or locations utilising non-Highways Agency owned Extra Effort Vehicles these may be included within the table below or recorded within the vulnerable location schedule provided in Appendix A.5 (also refer to Section 1.6.4).

Winter Service Route Summary				
Route Id	**Route type**	**Treatment type**	**Length**	**Target / design* treatment time (Turnaround time)**
	[carriageway/footway]	[precautionary/snow]		

* Delete as applicable

The detailed schedules for each WSR including drawings are provided in Appendix A.19.

Service Provider to provide schedules for each WSR including route reference, target / design treatment time, turnaround time and precautionary salt usage, vehicle details, instructions and inclusions/exclusions. Also append WSR drawings.

Separate 'route cards' giving more detailed instructions to drivers should be prepared and included within Appendix A.19.

Service Providers will ensure that clear information is provided to ensure that no gap in treatments between route or network boundaries can occur.

Service Provider to include a statement providing confidence to the Service Manager that the proposed WSR and estimated times, where treatment time has not been specified by the Highways Agency, will enable the performance requirements in the AMOR Severe Weather Requirement to be met.

Service Provider to include WSR for footways, cycle tracks and other such areas.

7 WINTER DECISION AND TREATMENT MATRICES

Decisions are made in the interest of service delivery and continuity, and takes account of weather conditions informed by the HAWIS and decision information, where applicable, from adjacent Service Providers and relevant Local Highway Authorities.

Service Provider to include other considerations such as local knowledge and experience, local geographical idiosyncrasies and residual salt on the road.

All decisions will be subject to continuous monitoring, recording and review.

All Winter Service decisions are evidence based and will be made in accordance with the guidance contained within the following decision and treatment matrices. A guide to repeat treatments has been made available in Appendix B – Supporting Information (B8 Repeat Treatments Guide).

Suggested decision and treatment matrices for precautionary treatment are shown in the following pages. Service Providers can modify these if necessary to suit their own specific local circumstances. Where changes have been made an explanation to justify the changes must be provided.

During periods of forecast severe weather [Service Provider] must remain in contact with [Forecast Provider] and should also take account of information from staff out on the [Area Network / Network / Project Road], Traffic Officer Service and CCTV when making decisions.

7.1 Decision Matrix

<table>
<tr><th colspan="2"></th><th colspan="3">Predicted Road Conditions</th></tr>
<tr><th>Road Surface Temperature</th><th>Precipitation etc.</th><th>Wet</th><th>Wet Patches</th><th>Dry</th></tr>
<tr><td>May fall below 1°C</td><td>No rain
No hoar frost
No fog</td><td rowspan="2">Salt before frost</td><td rowspan="2">Salt before frost
(see note 1)</td><td rowspan="2">No action likely, monitor weather
(see note 1)</td></tr>
<tr><td rowspan="5">Expected to fall below 1°C
(see note D)</td><td>No rain
No hoar frost
No fog</td></tr>
<tr><td>Expected hoar frost
Expected fog</td><td colspan="2">Salt before frost
(see note 2)</td></tr>
<tr><td>Expected rain BEFORE freezing</td><td colspan="3">Salt after rain stops</td></tr>
<tr><td>Expected rain DURING freezing</td><td colspan="3">Salt before frost and after rain stops
(see note 3)</td></tr>
<tr><td>Possible rain
Possible hoar frost
Possible fog</td><td colspan="2">Salt before frost</td><td>Monitor weather conditions</td></tr>
<tr><td colspan="2">Expected snow</td><td colspan="3">Salt before snow fall (see note 4)</td></tr>
<tr><td rowspan="3">Freezing Rain</td><td>Before rain</td><td colspan="3">Salt before rainfall (see notes 3 and 4)</td></tr>
<tr><td>During rain</td><td colspan="3">Salt during rainfall (see notes 3 and 4)</td></tr>
<tr><td>After rain</td><td colspan="3">Salt after rainfall (see notes 3 and 4)</td></tr>
<tr><td colspan="5">The decision to undertake precautionary treatments should, if appropriate, be adjusted to take account of residual salt or surface moisture.
The decision to undertake repeat treatments should take the guidance provided in Appendix B.8 into account</td></tr>
<tr><td colspan="5">Notes:
1) Particular attention should be given to any possibility of water running across carriageways and such locations should be monitored and treated as required.
2) When a weather warning contains reference to expected hoarfrost considerable deposits of frost are likely to occur and close monitoring will be required. Particular attention should be given to the timing of precautionary treatments due to the possibility that salt deposited on a dry road may be dispersed before it can become effective.
3) Under these circumstances rain will freeze on contact with surfaces and full pre-treatment should be provided even on dry roads. This is a most serious condition and should be monitored closely and continuously throughout the danger period.
4) The effectiveness of salt decreases as temperatures fall and effective treatments may not be guaranteed with salt towards the lower end of the temperature band. The use of alternative treatment materials must be considered when spreading at (the lower of air or road surface) temperatures below -7ºC or below -5ºC in low humidity conditions (relative humidity <80%).</td></tr>
</table>

7.2 Treatment Matrix Guide

	Weather Conditions Road Surface Conditions Road Surface Temperature (RST)	Air Temp	Treatment	
			Dry Salting (g/m^2)	Pre-wetted Salting (g/m^2)
Spread rates for pre-wetted salt are the combined weight of dry rock salt and the salt dissolved in the brine solution combined at 70:30 proportions by weight respectively with a maximum brine concentration when spread of 23%. Treatments should be carried out, whenever possible, after traffic has dispersed standing water. Successive half rate treatments (for both pre-wet and dry salt operations) should be considered for lightly trafficked roads, or on more heavily trafficked roads at times of low traffic e.g. Sunday mornings, at the lower end of temperature bands indicated. The effectiveness of salt decreases as temperatures fall and effective treatments may not be guaranteed with salt towards the lower end of the temperature band. The use of alternative treatment materials must be considered when spreading at (the lower of air or road surface) temperatures below -7ºC or below -5ºC in low humidity conditions (relative humidity <80%). Pre-wetted salt is the preferred treatment for all precautionary treatments whenever possible, including before snowfall. The rate of spread for precautionary treatments may, if appropriate, be adjusted to take account of residual salt or surface moisture. The spread rates are not applicable to very wet roads, when there is standing water or spray generated, or for very heavy hoar frosts. In these conditions roads should be closely monitored and consideration given to increasing the spread rate, making successive treatments or both.				
1.	Frost or forecast frost RST at or above -2°C		8	8
2.	Frost or forecast frost RST below - 2°C and above - 5°C and dry or damp road conditions		10	9
3.	Frost or forecast frost RST below - 2°C and above - 5°C and wet road conditions		16	15
4.	Frost or forecast frost RST at or below - 5°C and above -10°C and dry or damp road conditions		18	18
5.	Frost or forecast frost RST at or below - 5°C and above -10°C and wet road conditions (existing or anticipated)		2 x 15	2 x 15
6.	Light snow forecast <10 mm		20	18
7.	Medium/heavy snow or freezing rain forecast		2 x 20	2 x 18
When ice has formed or snow is lying dry salting is the preferred treatment unless the road is closed to traffic when pre-wetted salting may be used. Pre-wetted salting is the preferred treatment in advance of such conditions. For snow covering forecast to exceed 30mm ploughing should be conducted early enough to ensure snow accumulations do not exceed 10mm. The rates in the table are for precautionary salt treatment prior to snowfall which is essential to form a debonding layer and aid snow clearance.				
8.	Freezing rain falling		20 (successive)	
9.	After freezing rain		20	
10.	Ice formed (minor accumulations)	> -5°C	20	
11	Ice formed	≤ -5°C	2 x 20	
12.	Hard packed snow/ice	> -8°C	20 (successive)	
13.	Hard packed snow/ice	≤ -8°C	salt/abrasive (successive)	

7.3 Extreme Cold Precautionary Treatment Matrix

Alternative treatments when RST below -7°C at time of spreading (or, especially for dry salt spreading, when RST below -5°C at time of spreading for low humidity conditions)								
Conditions: Frost or Forecast Frost								
Dry rock salt component (by weight)		**70%**				**96%**	**100%**	
Liquid component (by weight)		**Magnesium chloride brine (30%)**	**Calcium chloride brine (30%)**	**ABP Brine [2] (30%)**	**Sodium chloride brine (30%)**	**Alternative [3] added before loading (4%)**		
Weather Conditions Road Surface Temperature (RST)	**Road Surface Conditions**	**PRE-WET SPREADING [1] (g/m^2)**				**DRY SPREADING (g/m^2)**		
RST at or below -5°C and above -7°C (Only for low humidity conditions <80%)	Dry or damp road	11	11	10	13	14	14	
	Wet road	18	19	17	21	22	22	
RST at or below -7°C and above -10°C	Dry or damp road	16	17	16	21	20	22	
	Wet road	27	28	26	35	34	37	
RST at or below -10°C and above -12°C	Dry or damp road	21	22	20	29	26	30	
	Wet road	35	36	34	49	43	50	
RST at or below -12°C	Dry or damp road	27	29	27	41	33	41	
	Wet road	46	48	45	68	56	68	

Notes:

- **Higher spread rates may require more than one pass to achieve, which Service Providers should make allowance for.**
- **A follow up treatment of 50% of the recommended spread rate should be considered in lightly trafficked areas at the lower end of the temperature bands indicated.**
- **To take account of residual salt during periods of sustained freezing, when surfaces are well drained and there is no melt water or ice present, rates of spread for treatments carried out within 6 hours of previous treatments may be 50% of the rates in the table.**

1) **Spread rates for pre-wet spreading are the weight of the dry salt and brine combined in the ratio 70% dry salt to 30% liquid component.**
2) **For definition of ABP brine see Appendix B.3.**
3) **Alternative liquid means either: magnesium chloride brine; calcium chloride brine; ABP Brine or; magnesium chloride brine plus ABP liquid. See definitions at Appendix B.4.**

7.4 Extreme Cold Precautionary Treatment Matrix - before snow and freezing rain

Alternative treatments <u>when RST</u> below -7°C at time of spreading (or, especially for dry salt spreading, when RST below -5°C at time of spreading for low humidity conditions)						
Conditions: Forecast Light Snow or Moderate / Heavy Snow and Freezing Rain [1]						
Dry rock salt component (by weight)	**70%**				**96%**	**100%**
Liquid component (by weight)	**Magnesium chloride brine (30%)**	**Calcium chloride brine (30%)**	**ABP brine [3] (30%)**	**Sodium chloride brine (30%)**	**Alternative [4] added before loading (4%)**	
Weather Conditions Road Surface Temperature (RST)	**PRE-WET SPREADING [2] (g/m^2)**				**DRY SPREADING (g/m^2)**	
RST at or below -5°C and above -7°C (Only for low humidity conditions <80%)	23	24	22	28	28	28
RST at or below - 7°C and above - 10°C	33	35	32	40	40	43
RST at or below - 10°C and above - 12°C	39	41	38	47	47	52
RST at or below - 12°C	47	50	47	58	58	70

Notes:

- **Higher spread rates may require more than one pass to achieve, which Service Providers should make allowance for.**

1) **Treatments for moderate / heavy snow and freezing rain are as for light snow plus a follow-up treatment at half the recommended spread rates when no treatments in previous six hours.**
2) **Spread rates for pre-wet spreading are the weight of the dry salt and brine combined in the ratio 70% dry salt to 30% liquid component.**
3) **For definition of ABP brine see Appendix B.4.**
4) **Alternative liquid means either: magnesium chloride brine; calcium chloride brine; ABP Brine or; magnesium chloride brine plus ABP liquid. See definitions at Appendix B.4.**

7.5 Extreme Cold Reactive Treatment Matrix - for compacted snow or ice

Alternative treatments when RST below -7°C at time of spreading (or, especially for dry salt spreading, when RST below -5°C at time of spreading for low humidity conditions)

Conditions: Compacted Snow or Ice

Dry rock salt component (by weight)	**0%**	**70%**				**96%**	**100%**
Liquid component (by weight)	**Magnesium chloride brine plus ABP (100%)**	**Magnesium chloride brine (30%)**	**Calcium chloride brine (30%)**	**ABP brine [3] (30%)**	**Sodium chloride brine (30%)**	**Alternative [4] added before loading (4%)**	
Weather Conditions Road Surface Temperature (RST)	**LIQUID SPREADING [1] (g/m^2)**	**PRE-WET SPREADING [2] (g/m^2)**				**DRY SPREADING (g/m^2)**	
RST at or below -5°C and above -7°C (Only for low humidity conditions <80%)	24	28	29	27	34	28	28
RST at or below -7°C and above -10°C	24	40	42	38	48	40	43
RST at or below -10°C and above -12°C	30	46	49	46	56	47	52
RST at or below -12°C	36	56	61	56	76	58	70

Notes:

- **Higher spread rates may require more than one pass to achieve, which Service Providers should make allowance for.**
- **As much material as possible should be removed by ploughing before applying de-icers.**
- **It may not be possible to treat and de-bond from the road surface ice / compacted snow layers exceeding 20mm thickness. Abrasives should be used until conditions become more favourable for de-icing.**
- **Frequent patrols should be made to determine the effectiveness of treatments and when further follow-up treatments are required.**
- **If the surface melts and becomes slippery an initial treatment of abrasives should be applied at a rate of 40g/m2 and successive treatments at 20g/m^2 until an acceptable level of friction is restored. Care should be taken to make further applications where ice or snow melts and refreezes later leaving abrasives beneath the ice surface and therefore ineffective.**
- **The use of alternative de-icers can provide effective treatments in a shorter time scale than dry salt and salt pre-wetted with sodium chloride brine.**

1) **Liquid only treatments identified in this table must only be spread from a dribble bar in discrete lines across the carriageway. This treatment may also be used in conjunction with rock salt spread at 20g/m2.**
2) **Spread rates for pre-wet spreading are the weight of the dry salt and brine combined in the ratio 70% dry salt to 30% liquid component.**
3) **For definition of ABP Brine see Appendix B.4.**
4) **Alternative liquid means either: magnesium chloride brine; calcium chloride brine; ABP brine or; magnesium chloride brine plus ABP liquid. See definitions at Appendix B.4.**

7.6 Footway and cycle track treatment snow clearance

Category (see 1.6.2)	Overnight Frost Conditions *overnight forecast temperatures below zero but not extending beyond 8am*	Daytime Frost Conditions *overnight forecast temperatures below zero extending beyond 8am*	Extended Frost Conditions *forecast temperatures remaining below zero throughout daylight hours*	Snow Events
1a	Precautionary treatment		Monitor and further treatment as required	Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 12 hours of cessation of snowfall, subject to availability of resources
1	No treatment	Reactive treatment (by 8am of that same day)	Monitor and further treatment as required	Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 24 hours of cessation of snowfall, subject to availability of resources
2	No treatment	Reactive treatment (by 8am of that same day)	Monitor and further treatment as required	Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 48 hours of cessation of snowfall, subject to availability of resources
3	No treatment	No treatment	Reactive treatment (by noon of that same day)	Snow removal must commence when resources come available from carriageway treatments. Endeavours must be made to complete clearance within 5 days of cessation of snowfall, subject to availability of resources
4	No treatment	No treatment	Reactive treatment not normally undertaken other than in response to specific circumstances	

8 ACTIONS FOR WEATHER CONDITIONS

This section of the Severe Weather Plan contains [Service Provider's] detailed operational procedures for Winter Service and alert procedures and actions in the event of other Severe Weather on the [Area No/Route DBFO] Network.

Service Provider to include area specific introduction as appropriate.

8.1 Precautionary treatment

The effectiveness of precautionary treatments can be significantly affected by how the treatment is applied. The following sections cover [Service Provider's] procedures for precautionary treatment using the appropriate treatment material for each part of the [Area Network / Network / Project Road].

Routes used by spreading vehicles will follow the appropriate WSR in Appendix A.19. [Service Provider] will aim to apply treatment as close, as is practicable, to the forecast time of freezing, while allowing sufficient time for the salt to form brine. In particular applying treatments during the early evening, to protect against a forecast of ice forming in the early hours of the following morning, will be avoided. Where treatment is required the most appropriate treatment type and spreading techniques will be used.

The following sections should be developed taking into consideration the information in Appendices B.3, B.4, B.6, B.7 and B.8.

8.1.1 Treatment type

The Highways Agency's preferred treatment is pre-wetted salt, though other materials may be appropriate for specific conditions or circumstances.

The use of pre-wetted salt provides the following advantages over dry salting:

- Better salt distribution across and along the carriageway
- Lower salt loss during spreading and due to trafficking after spreading
- Increased dissolution, in particular for colder temperatures

For treatments on very wet roads and /or when precipitation has occurred after spreading, repeat treatments are required and spreading dry salt in these circumstances will not prevent the need for these repeat treatments.

[Service Provider] will select the most appropriate material suitable for use across the [Area Network / Network / Project Road] taking into consideration the location and forecasted weather condition to maximise the effectiveness of the precautionary treatment as detailed below.

Service Provider to include details of the treatment type(s) across the [Area Network / Network / Project Road] e.g. dry salt, pre-wetted salt, potassium acetate, ABP treated salt etc., including where the selected option might need to be changed and the reasons for it. A reference to Section 5.2 and Appendix A.19 should be included.

Service Provider to detail the treatment of footways, cycle tracks and paved pedestrian areas where appropriate.

8.1.2 Spreading techniques and operational considerations

Service Provider to include details of the spreading techniques, for different types of carriageway and location, including taking into consideration the material being used, making reference to Section 1.6.2 and to the further information in Appendix B.6.

Service Provider must include specific details of any sections of roads of more than three lanes and describe the approach taken to ensure adequate treatment of all parts of the carriageway.

Service Provider must detail procedures for tackling the special considerations listed below (not exhaustive) making reference to the further information in Appendix B.5:

- *Effectiveness of salt after rain;*
- *Low temperature combined with low humidity conditions;*
- *Extreme cold, when salt may not provide for an effective treatment;*
- *Freezing rain;*
- *Cross winds;*
- *Negatively textured surfacing;*
- *Porous asphalt;*
- *Areas susceptible to run off with the potential to re-freeze;*
- *Vulnerable sites.*

[Service Provider] will, where feasible, treat only targeted areas of the [Area Network / Network / Project Road] based on where ice formation is forecast.

Service Provider to also include other operational considerations as appropriate e.g. treatment of special structures, treatment during peak traffic flow periods, road works, treatment within tunnels, road over road bridges, operations near railways, Smart Motorways and innovative trials. Details should also be included in the Winter Service route schedule (Appendix A.19) and a cross reference included within this section.

8.2 Reactionary treatment for snow and ice

The effectiveness of treatments of snow and ice can be significantly affected by the method of application of the treatment. The following sections cover [Service Provider's] operational techniques for the removal of snow and ice. The techniques include ploughing, blowing, the use of snow fences and snow gates together with changes to the methods of application of treatment materials when snow or ice is already present on the paved area. Guidance is provided in Appendix B.7.

It is important that all routes are cleared, in accordance with the snow clearance requirement provided within Section 6.1.2, and that no area is abandoned for the sake of concentrating resources to one or two problem areas. Any decision for route closure or abandonment can only be made by the HA incident commander, to be advised within the improved coordination process. In all cases therefore the defined treatment routes will be adhered to, and where conditions demand a more intensive treatment in specific areas, this will be achieved by calling out Area Operational Reserve Winter Service Vehicles for those areas.

The following sections should be developed taking into consideration the information in Appendices B.3, B.4, B.6, B.7 and B.8.

8.2.1 Ploughing and snow clearance techniques

Service Provider to include details and procedures for ploughing, including clearly defined decision points for the fitment of ploughs and commencement of ploughing. (see Appendix B.7)

This section must detail the approach taken for ploughing especially of any sections of road of more than three lanes including specific details of which lanes are to be ploughed.

Service Provider must detail procedures for tackling the special considerations listed below (not exhaustive):

- *Cross winds;*
- *Snow drifts and build-up of snow;*
- *Areas susceptible to run off with the potential to re-freeze;*
- *Traffic calming areas;*
- *Solid Vertical Barriers (SVB).*

[Service Provider's] clearance plan for each SVB location given in Appendix A.20. This schedule should also be cross referenced to Appendix A.19 – Winter Service route schedules and drawings.

Service Provider to include procedures for bulk removal of snow to identified storage locations for temporary stockpiling.

Service Provider to include procedures to remove any build-up of snow across rail, bridges and snow gates, and along snow fences and measures to avoid further build up.

Service Provider to include operational considerations (and arrangements in place) as appropriate e.g. maintenance of snow fences, operation of snow gates, use of emergency crossings, road over road bridges, Abnormal Invisible Load (AIL) movements and operations near railways.

8.2.2 Spreading techniques

Service Provider to include details of the spreading techniques used during de-icing operations, for different types of carriageway and location, including taking into consideration the material being used.

The special considerations in Section 8.1.2 where applicable must be considered when completing this section.

8.2.3 Aftercare and follow up treatments

Service Provider to include details of aftercare and follow up treatments e.g. clearing side roads and lay-bys. Include detail of assessment of any build-up of detritus and follow up treatments (e.g. sweeping) where needed.

8.2.4 Arrangements for use of blowers

[Service Provider] can use snow blowers allocated to their [Area Network / Network / Project Road] without prior approval but must ensure the use is notified up to [an agreed predetermined level]. National procedures for management of the both Area Operational Reserve Winter Service Vehicles and National Reserve Vehicles are in Appendix B.5.

Where the equipment is to be brought in from another area the Service Delivery Manager will liaise, as necessary, with the National Winter Specialist and other relevant parties.

[Service Provider] has [number] operatives qualified to operate snow blowers are detailed at Appendix A.7.

Service Provider to include full detailed arrangements and procedures for the use of snow blowers including details of transport arrangements.

8.3 Freezing rain / rain falling on extremely cold surfaces

8.3.1 Operational considerations

Service Provider to outline operational arrangements giving full consideration to the potential impact of freezing rain/ rain falling on extremely cold surfaces on the [Area Network / Network / Project Road] by taking account of:

- *The nature of the terrain involved, e.g. gradients or difficult alignments, and where the phenomenon could be more likely;*
- *The volume of traffic likely to be on the [Area Network / Network / Project Road];*
- *The hazards that would be generated;*
- *The use of VMS;*
- *Ongoing monitoring of the situation; and*
- *The mitigating measures that could be adopted.*

8.3.2 Hazard mitigation

The nature of freezing rain means that treatments will have virtually no effect initially and ice will form on the carriageway. Rain falling on extremely cold surfaces can produce similar effects. Mitigation of the hazard is therefore a significant aspect of the actions taken in response to freezing rain or rain falling on extremely cold surfaces. The main action is to inform road users of the hazard where available fixed or mobile Variable Message Signs (VMS) will be used as detailed in Appendix B.6.

More proactive measures such as closing the road as the rain arrives and holding the traffic (rather than diverting) until such times as it is deemed safe to proceed may be considered. Such considerations will need to be made on a local basis taking into account local circumstances.

[Service Provider] will liaise with Police Control Offices (PCOs) and / or RCCs to provide advance warning to recovery companies when any incidents occur as a result of the freezing rain or rain falling on extremely cold surfaces. *Procedures for giving such advance warning would need to be established in advance with PCOs and RCCs and documented.*

8.4 High winds (including Severe Gales and Storms)

High winds/severe gales can occur at any time of year but are most likely from September through to June.

8.4.1 Operational considerations

Service Provider to include full detailed arrangements and procedures in the event of high winds/severe gales including signage, picking up debris, location of meteorological equipment. Actions and procedures to be developed in consultation with the RCC.

Service Providers are reminded of their responsibilities in ensuring the safety and security of signs and other street furniture. This is particularly important in advance of forecast high winds.

Any relevant detail must also be included in the route schedule (Appendix A.19) and a cross reference included within this section.

Service Provider to make reference to any additional operational plans (e.g. M48 Severn Crossing) specific to dealing with Severe Weather.

8.5 Heavy rain

8.5.1 Pumping, jetting and clearance techniques

Service Provider to include details and procedures for pumping, jetting and clearance techniques. Actions and procedures to be developed in consultation with the RCC.

Service Provider to include any identified areas where floodwater can be pumped to.

Service Provider to include detailed arrangements and procedures for the treatment of carriageway, footways, cycle tracks and pedestrian areas where appropriate.

Any relevant detail such as areas vulnerable to flooding should also be included in the route schedule (Appendix A.19) and a cross reference included within this section.

Service Provider to include full detailed arrangements and procedures for the use of pumping and jetting equipment.

8.5.2 Operational considerations

Service Provider to include operational considerations as appropriate e.g. maintenance of drainage systems liable to flooding and operations near railways.

Any relevant detail such as areas vulnerable to flooding should also be included in the route schedule (Appendix A.19) and a cross reference included within this section.

Service Provider to make reference to any additional operational plans.

8.5.3 After care and follow up treatments

Service Provider to include details for treatment to the Area Network including footways, cycle tracks and pedestrian areas where appropriate.

8.6 Fog

[Service Provider] will undertake the following specific measures as appropriate to mitigate the hazard:

- Where available fixed or mobile VMS should be used to warn road users of the hazard. The existing established procedures for requesting VMS settings to be made should be followed well in advance. The following legend is currently the most appropriate to use – 'FOG SLOW DOWN'. This will require arrangements and protocols to be established with the appropriate RCC.
- National Incident Liaison Officer (NILO) and/or Highways Agency Press Officer should be contacted in order that the local media can be advised as necessary.
- Where available use of variable mandatory speed limits should be considered. This will require arrangements and protocols to be established with the appropriate Police Control office or RCC as part of the advance planning procedures.

Service Provider to include area specific introduction and list the procedures in place for warning motorists (i.e. use of fog detection systems if available, signage). Actions and procedures to be developed in consultation with the RCC.

8.7 High temperatures

In the event of high temperatures where vehicles and occupants are static on the motorways and trunk roads for long periods of time, [Service Provider] will provide support and assistance to the RCC and the Police as requested.

Service Providers will identify locations which may be susceptible to problems (such as due to road construction type) in high temperatures. These locations will be detailed within the Vulnerable Location Schedule. Service Providers to include details of any enhanced monitoring of susceptible road construction types (for example where there is risk of failed concrete expansion joints or softened bituminous carriageway surfaces including bridge decks) that will be implemented under such weather conditions and procedures for the treatment of any damage that may result.

[Service provider] has identified the following Locations that may be susceptible to damage or other problems due to high temperatures. Full details are provided within the Vulnerable Location Schedule.

Road	Location	Risk
[A999]	[e.g. junction / exit]	[Detail]

APPENDIX A - SCHEDULES

NOTE:

To reduce the size of the Severe Weather Plan, the Service Provider may include certain appendices within a box of reference and not append these directly to the plan. Where this is applicable a note has been added at the start of the Appendix. The Service Provider must agree an acceptable approach with the Service Manager and confirm the location of the box of reference.

A.1 AUDIT CHECKLIST

Safe roads, Reliable journeys, Informed travellers

HIGHWAYS AGENCY

Activity	August	September	October	November	December	January	February	March	April	May	June	July
Submit Severe Weather Plan	☐ by 21st											
Severe Weather Plan approved by HA		☐ by 18th										
Completion of Severe Weather Desk exercises and briefings			☐									
Feedback and action planning from exercises and briefings					☐ by 18th							
Complete and submit Salt Capability Spreadsheet			☐ by 1st	☐ by 1st	☐ by 1st	☐ by 1st	☐ by 1st	☐ by 1st	☐ by 1st			
Complete and submit Non warranty defect report spreadsheet			☐ by 15th	☐ by 15th	☐ by 15th	☐ by 15th	☐ by 15th	☐ by 15th	☐ by 15th			
WRF1 reporting requirements met			☐	☐	☐	☐	☐	☐	☐			
Review and update the winter service and severe weather infrastructure inventory database							☐				☐	
Finalise list of key issues to feed into winter lessons learnt								☐ by 31st				
Winter & severe weather review										☐		
Winter & severe weather report to HA (Operational Assessment Report)											☐	
Effectiveness of Sensors Inspection Report		☐					☐					
Submit Salt Restocking Plan										☐ by 31st		
Salt Restocking Plan approved by HA											☐ by 30th	
Salt Restocking Plan in place												☐
Vehicle maintenance schedule activities met	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

A.2 AREA MAP

– may be inserted within a box of reference

The area map must include, as a minimum, the following:

- *Overall extent of the [Area Network / Network / Project Road]*
- *Local Highway Authority boundaries*
- *Details of adjoining networks*
- *Police authority boundaries*
- *Treatment routes*
- *Weather forecast domains*
- *Ice Prediction outstations*
- *Compounds and depots*
- *Network Features (snow gates, emergency crossovers, snow fences, vertical concrete barriers, rivers, streams and brooks, coastal defences, bridges, open areas and forest areas)*
- *Vulnerable locations, susceptible to ice formation, flooding etc.*

In addition, consideration must be given to including the following information:

- *Topographical features such a height and areas of dense population*
- *Major transport hubs (e.g. airports, ports and major railway stations)*
- *Location of contingency supply facilities (plant, salt, fuel etc.)*

The plan must be to a scale, and of a size, to allow the above information to be displayed.

Separate maps should be included within this Appendix to detail footway and cycle track treatments.

A.3 INTERFACE DRAWINGS

– may be inserted within a box of reference

Standard Highways Agency interface drawings for the [Area No / Route DBFO] Network to be inserted here.

A.4 NETWORK FEATURES

Emergency Crossings

The Service Provider to complete the following table highlighting the location and type of emergency crossings that exist on the [Area Network / Network / Project Road]. Details of operation and maintenance of these facilities should be included.

Road	Location	Type
[A999]		

Emergency Refuge Areas

The Service Provider to complete the following table highlighting the location and type of emergency refuge areas that exist on the [Area Network / Network / Project Road].

Road	Location	Type
[A999]		

Solid Vertical Barrier

The Service Provider to complete the following table highlighting the location and length of solid vertical barrier that exist on the [Area Network / Network / Project Road]. Details of inspection and maintenance to these barriers should be included. Where none exist a positive statement to that effect should be included here.

Road	Location	Length
[A999]		

Traffic Calming Areas

The Service Provider to complete the following table highlighting the location and type of traffic calming areas that exist on the [Area Network / Network / Project Road].

Road	Location	Type
[A999]		

Smart Motorway Sections with Hard Shoulder Running

The Service Provider to complete the following table highlighting the location and length of Smart Motorway sections with Hard Shoulder Running that exist on the [Area Network / Network / Project Road]. Where none exist a positive statement to that effect should be included here.

Road	Location	Length
[A999]		

Snow Gates

The Service Provider to complete the following table highlighting the location and type of snow gates that exist on the [Area Network / Network / Project Road]. Details of operation and maintenance of these facilities should be included. Where none exist a positive statement to that effect should be included here.

Road	Location	Type
[A999]		

Snow Fences

The Service Provider to complete the following table highlighting the location and type of snow fences that exist on the [Area Network / Network / Project Road]. Details of maintenance of these facilities should be included. Where none exist a positive statement to that effect should be included here.

The procedures for reviewing the locations and effectiveness of existing fencing and for identifying new locations should also be described.

Road	Location	Type
[A999]		

Snow Storage

The Service Provider to complete the following table highlighting the locations where snow removed from the [Area Network / Network / Project Road] is to be stockpiled. Evidence of provisional approval for use of the locations must be indicated.

Road	Location	Approval sought
[A999]		

Rivers, Streams and Brooks

The Service Provider to complete the following table highlighting the location of rivers, tributaries and flood plains which historically have caused flooding on the [Area Network / Network / Project Road]. Details of water courses and areas subject to flooding from seepage of water onto the carriageway from adjacent land should also be included. Where none exist a positive statement to that effect should be included here.

Road	Location	Type
[A999]		

Coastal Defence

The Service Provider to complete the following table highlighting the location of coastal areas that exist on the [Area Network / Network / Project Road] subject to flooding. Where none exist a positive statement to that effect should be included here.

Road	Location	Type
[A999]		

Bridges, Open Areas and Forest Areas

The Service Provider to complete the following table highlighting the location of forests and areas of trees most susceptible to high winds that exist on the [Area Network / Network / Project Road]. Details of bridges and open areas subject to strong cross winds should also be included. Where none exist a positive statement to that effect should be included here.

Road	Location	Type
[A999]		

A.5 VULNERABLE LOCATIONS SCHEDULE

Service Provider to refer to list provided in Section 1.6.4

Vulnerable Locations Schedule	
Reference Number:	
Location	[Location in relation to: junction numbers for motorways/ relevant landmarks for APTR]
Problem	[Detail of problem as identified in section 2.4]
Is the problem particularly HGV related (Yes / No)	[If Yes, please state the specific HGV related problem]
Has this site experienced problems before or is it an identified risk?	[Yes/No (if yes Service Provider to give details (including impact) of when issues have occurred]
Detailed Mitigation Measures	
Mitigation measure(s)	[Details of the mitigation measure(s) to be put in place]
When enacted	[Details of when the mitigation measures will be put in place i.e. prior to the event/during the event]
Who enacts	[Detail who triggers instigation (and on what basis) of the mitigation measures]
Who will manage the response	[Detail who will manage the response & how this will be carried out]
Are diversion routes to be used?	[If diversion routes are utilised, detail what they are and what measures are in place to ensure they remain serviceable during the severe weather event]
Pre-deployment of resources	[Detail of what resources will be deployed and where from, where they will be deployed to & when]
Use of VMS	[If VMS is to be use confirm the arrangements and agreements, consultation with relevant RCC/NTOC]
Other measures put in place	[Detail any further mitigation measures not mentioned above]
Assistance from Service Provider resources	[Details of what additional resources (staff & plant) are required & from where they will come]
Assistance from additional Highways Agency resources	[Details of what additional resources are required, has consultation been carried out and agreements in place, what is process for calling in these resources]
Assistance from External Sources	[Details of assistance required from such entities as Traffic Officer Service, Police, RCC, Local Authorities etc.]

A.6 DECISION MAKER DUTY ROTA

Service Provider to include duty rota

A.7 OPERATIVES SCHEDULE

– may be inserted within a box of reference

Operative Schedule						
Base	Name	Winter NVQ Number	NVQ Expiry	Licence No	NVQ Coverage	Employee or Contracted
[base location]	[name]	[reference]	[date]	[reference]	[H/P/S]	

Key to NVQ Coverage:

H Qualified to operate Highways Agency spreaders

P Qualified to operate Provider spreaders

S Qualified to operate Highways Agency Snow Blowers

A.8 TRAINING RECORDS

– may be inserted within a box of reference

A.9 RISK ASSESSMENTS

Service Provider to include risk assessments

A.10 INTERNAL CONTACT LIST

Service Provider to include contact information for the key personnel within the organisation.

A.11 EXTERNAL CONTACT LIST

Service Provider to include contact information for the Highways Agency (Service Manager, press officers, HAIL), Police, adjacent Service Providers (MA, ASC, MAC, DBFO), adjacent Local Highway Authorities, weather Forecast Provider, HAWIS and others. A sample external contact list is shown below:

Name	Role	Organisation	Telephone	Fax	Email
[name]	Service Manager	Highways Agency			
[name]	Service Delivery Manager	Highways Agency			
[name]	National Winter Specialist	Highways Agency			
	Highways Agency press officers	Highways Agency			
	HAIL	Highways Agency			
	NTOC	Highways Agency			
RCC ([Region])		Highways Agency			
RCC ([Region])		Highways Agency			
NRTS	Provider of roadside telecommunications services				
[name]	Forecast Provider	[organisation]			
[name]	HAWIS	[organisation]			
[name]	HAWIS TechMAC / RTMC	[organisation]			
[name]	Primary Salt supplier	[organisation]			
[name]	Secondary Salt supplier	[organisation]			
[name]	Vehicle Maintenance Contractor	[organisation]			

A.12 MUTUAL AID AGREEMENTS

– may be inserted within a box of reference

A.13 SEVERE WEATHER DESK DUTY ROTA

A.14 BACK UP REPORTING FORMS

– may be inserted within a box of reference

This Appendix includes the following standard forms:

i. Notification of Proposed Treatments

ii. Daily Operational Update

iii. Hourly Operational Update

The forms should only be used where the WRF1 system has not been used for reporting.

[Service Provider name and logo]	**[Service Provider address line 1]** **[Service Provider address line 2]** **[Service Provider address line 3]** **[Service Provider address line 4]** **[Service Provider telephone]** **[Service Provider fax]** **[Service Provider email]**
Distribution list	
[Name, organisation, fax number/email]	

NOTIFICATION OF PROPOSED TREATMENTS
for [Area/DBFO Route]

For the 24 hour period started at 12:00 hrs on				
Minimum Air Temperature	Minimum RST	Time RST zero		
Winter Service Action Required:	YES		NO	

Proposed Treatment

Route No	Route Description	Spread Rate (g/m^2)	Start Time	Comments

Additional Comments

Actioned by:		Verified by:	
Date & Time:		Date & Time:	

[Service Provider name and logo]	**[Service Provider address line 1]** **[Service Provider address line 2]** **[Service Provider address line 3]** **[Service Provider address line 4]** **[Service Provider telephone]** **[Service Provider fax]** **[Service Provider email]**
To	
[Highways Agency Service Manager]	

DAILY OPERATIONAL REPORT
for [Area/DBFO Route]

For the 24 hour period started at 12:00 hrs on	

Operational Summary

Route No	Proposed Treatment			Actual Treatment			Comments
	Spread Rate (g/m^2)	Start Time	Finish Time	Spread Rate (g/m^2)	Start Time	Finish Time	

Additional Comments

Recorded by:	

[Service Provider name and logo]	[Service Provider address line 1] [Service Provider address line 2] [Service Provider address line 3] [Service Provider address line 4] [Service Provider telephone] [Service Provider fax] [Service Provider email]
To	
[Highways Agency Service Manager]	

HOURLY OPERATIONAL UPDATE **for [Area/DBFO Route]**		
Date	Time	
Network Summary		
Network Status Summary		
Road No	Condition	Ongoing Operations
Operational Report		
Recorded by:		

A.15 COMPOUNDS, DEPOTS AND FACILITIES SCHEDULE

– may be inserted within a box of reference

Service Provider to include all compounds, depots and other facilities and should include full postal address, contact details, and facilities available e.g. salt material storage, alternative material storage, brine production, loading hoppers, fuel storage, backup power supply, communications, garaging, workshops, welfare, etc.). A sample compounds and depots schedule is shown below:

Compounds, Depots and Facilities Schedule						
Compound, Depot or Facility Name	Owner	Postal Address	Purpose	Access Arrangements	Contact Details	Facilities
[name]	[Highways Agency/ Service Provider]	[address]	[description of purpose]	[details]	[phone, fax and radio call sign]	[comprehensive list]

A.16 FUEL, PUMP MAINTENANCE AND CONTINGENCY ARRANGEMENTS

Depot	Supplier	Fuel Type & Grade	Maximum fuel storage capacity (Gas Oil Litres)	Maximum fuel storage capacity (DERV Litres)	Minimum fuel storage (Litres)

The Service Provider to include within the table below details of fuel supply contingency and pump maintenance arrangements.

Depot	Contingency Arrangements	Pump Maintenance Arrangements

A.17 SALT RE-STOCKING PLAN

Salt re-stocking plan	
Primary Salt Supplier:	
De-icing material	[Identify what de-icing materials will be held]
Quantity of de-icer required for winter season	[Detail what de-icing material quantity is currently held and what will be held at the start of the winter season]
Re-supply arrangements	[Detail when re-ordering of salt will take place including summer restocking]
Stock control arrangements	[Detail what measures are in place to monitor salt stocks]

Salt re-stocking plan	
Secondary Salt Supplier:	
De-icing material	[Identify what de-icing materials will be held]
Quantity of de-icer required for winter season by depot	[Detail what de-icing material quantity is currently held and what will be held at the start of the winter season]
Re-supply arrangements	[Detail when re-ordering of salt will take place including summer restocking]
Stock control arrangements	[Detail what measures are in place to monitor salt stocks]

Salt re-stocking plan	
Reserve and Contingency Supplier:	
De-icing material	[Identify what de-icing materials will be held]
Quantity of de-icer required for winter season by depot	[Detail what de-icing material quantity is currently held and what will be held at the start of the winter season]
Re-supply arrangements	[Detail when re-ordering of salt will take place including summer restocking]
Stock control arrangements	[Detail what measures are in place to monitor salt stocks]

REPORTING THRESHOLD PROFILE		
Date (from)	Date (To)	Reporting threshold (Days)

A.18 VEHICLES AND PLANT SCHEDULE

Service Provider to include spreaders, ploughs, loading shovels, snow blowers, pumps, jetting equipment, sweepers and other specialist plant for use in Severe Weather conditions. A sample Vehicle and Plant schedule is shown below:

Area Operational Winter Service Vehicle Schedule						
Owner	Location	Type	Capacity	VRN or ID	Plough No	Route
[Highways Agency/ Service Provider]	[name]	[type of vehicle]	[m^3 for spreaders]	[VRN of Identification Number]		[route reference]

Area Operational Reserve Winter Service Vehicle Schedule					
Owner	Location	Type	Capacity	VRN or ID	Plough No
[Highways Agency/ Service Provider]	[name]	[type of vehicle]	[m^3 for spreaders]	[VRN of Identification Number]	

National Reserve Winter Service Vehicle (Based in [Area]) Schedule					
Owner	Location	Type	Capacity	VRN or ID	Plough No
[Highways Agency/ Service Provider]	[name]	[type of vehicle]	[m^3 for spreaders]	[VRN of Identification Number]	

Extra Effort Vehicle Schedule					
Owner	Location	Type	Capacity	VRN or ID	Plough No
[Highways Agency/ Service Provider]	[name]	[type of vehicle]	[m^3 for spreaders]	[VRN of Identification Number]	

Snow Blower Schedule			
Owner	Location	Type	VRN or ID
[Highways Agency/ Service Provider]	[name]	[type of vehicle]	[VRN of Identification Number]

A.19 WINTER SERVICE ROUTE SCHEDULES AND DRAWINGS

Service Provider to include winter service precautionary and snow route schedules and drawings. A sample route schedule is shown below. These must be included within the main Severe Weather Plan, and cannot be included within the box of reference only.

[Area No / Route DBFO] Winter Service Route Schedule [201x/201x]						
Route Number		Route Description				
Base Compound			Vehicle Type			
Salt Usage (@ 20gm^2)	tonnes		Vehicle VRN			
Route design time	hrs:mins		Vehicle Capacity			m^3
Turnaround Time	hrs:mins		Precautionary time			
Special Route Features						

Part	Description (inclusions/exclusions and other special considerations including road & junction numbers)	No. of Lanes	Action (Travel/ Treat)	Distance (Travel)	Distance (Treat)	Distance (Cumulative)
1						
2						
3						
TOTALS						

A.20 SOLID VERTICAL BARRIER SCHEDULE AND CLEARANCE PLAN

– may be inserted within a box of reference

Solid Vertical Barrier Location Schedule	
Solid Vertical Barrier Reference Number: [Reference to *Area Network / Network / Project Road* map]	
Location	[Location in relation to: junction numbers for motorways/ relevant landmarks for APTR]
Cross Sectional Position	[Location in verge or central reserve]
Distance from Adjacent Running Lane	[Distance from barrier to nearest running lane]
Construction of Adjacent Verge	[Grass / Hardened / Filter Drain / V-Channel etc.]
Number of Running Lanes	[Number of running lanes adjacent to barrier]
Hard Shoulder Details	[Details of any hard shoulder present – width, any other features]
Slip Roads Present	[Details of any diverging/merging slip roads present at the location]
Large Hatching Areas	[Details of any large hatching areas present - for example near diverge/merge tapers]
Resources Required for Echelon Ploughing	[Resources required for echelon ploughing including any plant required for bulk clearance, record which WSR's are utilised]
VMS Available	[Details of VMS present - Mobile VMS required or barrier in location with permanent VMS]
Additional Non-Dedicated Vehicles	[Details of non-dedicated vehicles that will assist in clearance]
Assistance from External Sources	[Details of assistance required from such entities as Traffic Officer Service, Police, RCC etc.]

APPENDIX B – SUPPORTING INFORMATION

B.1 DEFINITIONS AND ABBREVIATIONS

Service Provider to complete this list, including definitions of all key terms and abbreviations used.

The National Severe Weather Warning System (NSWWS) – Providing warnings, mainly for Category 1 and 2 responders (as defined in the Civil Contingencies Act 2004), of Severe Weather.	
Regional advisory of severe or extreme weather warning (Advisory)	Advisories are issued by 1300hrs daily as routine and indicate confidence of expected Severe Weather (or unusual extreme weather). Early and flash warnings supersede advisories when confidence levels are 60% or greater.
UK Advanced warning of Severe Weather (early warning)	An early warning of Severe Weather will normally be issued up to several days in advance whenever the overall risk of widespread disruption in any UK region is 60% or greater.
Regional Severe Weather warning (flash warning)	Flash warnings of Severe Weather are issued when confidence of an event reaching the Severe Weather criteria is above 80%, and should give a minimum of two hours notice. Warnings are issued for every affected county or unitary authority.
Flood Forecasting Centre (EA/Met Office) – Alerting emergency responders in England and Wales to the possibility of urban surface water flooding as a result of extreme rainfall.	
Extreme Rainfall Alert (ERA)	Alert issued when there is a 20% or greater probability of exceeding the following extreme rain thresholds: 30mm per hour; 40mm in three hours or; 50mm in six hours.
The Environment Agency Flood Warning System – warnings of river and coastal flooding.	
Flood watch	Flooding of low lying land and roads is expected. Be aware, be prepared, watch out.
Flood warning	Flooding of homes and businesses is expected. Act now!
Severe flood warning	Severe flooding is expected. There is extreme danger to life and property. Act now!
All clear	Flood Watches or Warnings are no longer in force for this area.
Met Office Severe Weather Warnings – Flash warnings for a range of weather conditions which are not unusual. The conditions below, defined by the Met Office, give guidance concerning the weather likely and the criteria for issue of the flash warnings.	
Heavy rain	Expected to persist for at least 2 hours and to give at least 15mm of rain within a 3 hour period or:- More than 25mm per day on already saturated ground.
Fog	Warnings of fog are issued when visibility is expected to fall below 50 metres, at which severe disruption to transport can be expected.
Heavy snow	Snow falling at a rate of 2cm/hour or more expected for at least 2 hours.
Very heavy snow	Heavy snow which accumulates to 15cm or more
Blizzards	Moderate or heavy snow combined with winds of 30mph or more with visibility reduced to 200 metres or less; or drifting snow giving rise to similar conditions.
Severe blizzard	Heavy snow accompanied by winds of 30mph or more, reducing visibility to near zero.
Widespread icy roads, glazed frosts and freezing rain	Icy roads occur when the road surface temperature of wet roads drops below zero and ice is formed. Freezing rain occurs when rain becomes 'super-cooled' and when it hits a cold surface it freezes immediately and forms a layer of clear ice.
Severe gales	Repeated gusts of 70mph or more over inland areas, with a risk to high-sided vehicles being blown over.
Storms	Repeated gusts of 80mph or more over inland areas, which could cause cars to be blown out of their lane on the carriageway, which may cause traffic collisions.

Met Office Heat-Health Watch – this system identifies four levels of response based upon thresholds	
High temperatures, Heat wave	The temperature thresholds vary by region, but an average threshold temperature is 30°C by day and 15°C by night on at least two consecutive days and the intervening night.
Reserve Winter Service Vehicles	
Reserve Threshold	The Reserve Threshold is the point at which the number of Area Operational Reserve Winter Service Vehicles available to be utilised are reduced to a point which could make it difficult to maintain the optimum level of Winter Service on the Area Network. This threshold level is proposed by the Service Provider for agreement with the Service Manager.
Critical Incident	A Critical Incident is when the reserve winter fleet situation / reserve winter fleet availability reaches a level that seriously impacts upon the Highways Agency and its ability to maintain a safe Area Network during.
Area Operational Reserve	An Area Operational Reserve is all Winter Service Vehicle assigned to a particular Area that may be in rotation and not currently designated a specific precautionary treatment route. It will be required to carry out treatments on the Area Network when a vehicle that has been designated a particular treatment route is unavailable or becomes the Operational Winter Service Vehicle as part of the rotation. These vehicles may be designated to a specific snow clearance route, or vulnerable location to support Operational Winter service Vehicles. The use of an Area Operational Reserve does not require specific approval from the Highways Agency.
National Reserve	A National Reserve is a Winter Service Vehicle that is held in a particular Area, but may be transferred to any part of the Highways Agency's strategic road Network to help manage Severe Weather incidents. The use of National Reserves requires specific approval from the Highways Agency.
Extra Effort Vehicles	Additional non-Highways Agency owned vehicles required to supplement the allocated operational, reserve vehicles and national reserve vehicles that may be required during sustained periods of snowfall or extreme cold
Salt Stock	
Operational Salt Stock	Is the salt that the Service Provider purchases, manages and uses to provide the lump sum routine Winter Service as defined in the AMOR or within the RWSC / NMM.
Current Maximum Storage Capability (CMSC)	This is the total storage capacity currently available in storage facilities provided by the Highways Agency under the contract.
Operational Salt Stock at Start of Season	Is the minimum volume of salt required to be in place within the Area concerned by 1st September each year. If this figure exceeds storage capacity as defined by the CMSC, the service provider will be required to provide the additional storage capacity.
Minimum Contractual Salt Stock Level	Is the minimum operational salt stock level that must be maintained from 1st October each year to 1st April of the following year.
Minimum Capability	Is the capability level, in days, assuming all salt storage facilities are at the Minimum Contractual Stock Levels
Reporting Threshold	Is the capability level at which point salt supplies will be considered to be approaching critical and will be the threshold for the automatic re-ordering of salt. This definition, which now relates directly to acquiring immediate salt supplies, should be considered in detail by Service Providers to ensure they set an appropriate reporting threshold profile.

Abbreviations			
CCTV	Closed Circuit Television	NTOC	National Traffic Operations Centre
CMM	Crisis Management Manual	NVRM	National Vehicle Recovery Manager
DBFO	Design Build Finance & Operate	RCC	Regional Control Centre
DfT	Department for Transport	SP	Service Provider
ECW	Emergency Customer Welfare	TOS	Traffic Officer Service
ESS	Environmental Sensor Station	VMS	Variable Message Sign
HA	Highways Agency	VRN	Vehicle Registration Number
HAWCS	Highways Agency Weather Central Service	WMO	Winter Maintenance Officer
HAWIS	Highways Agency Weather Information Service	WRF1	Winter Reporting Form
NILO	National Incident Liaison Officer		

B.2 SEVERE WEATHER DESK EXERCISES AND BRIEFINGS

Severe Weather Desk Exercises

Service Provider will plan and deliver a Severe Weather Desk exercise. This will primarily be to test the delivery and resilience of the Winter Service element of this Severe Weather Plan. Planning for the exercise **must** be in consultation with Service Manager, Emergency Planning Managers and the National Winter and Severe Weather Team.

Details for each season's Severe Weather Desk exercise will be issued by the National Winter & Severe Weather team before the end of July 2014. This will be in the form of a guidance note. This will provide the mandatory national objectives, and include objectives identified from details provided within the 13-14 Operational Assessment Reports.

Service Provider will plan exercises to test critical and vulnerable points in their winter response, and identified objectives, and strive to identify areas for improvement. Exercises are to be delivered by the end of October.

Severe Weather Briefings

Service Provider to hold Severe Weather briefing sessions with representatives from key stakeholders, including Traffic Officer Service, RCC, Local Highway Authorities, Emergency Services and Highways Agency Regional Press Officers.

Full details will be provided within a guidance note to be issued by the National Winter & Severe Weather team before the end of July 2014. Briefings are to be delivered by the end of November.

Service Provider to submit the list of attendees at the Severe Weather briefings to the National Winter and Severe Weather Team via email winterteaminbox@highways.gsi.gov.uk. An example of the attendance register is shown below.

Register of Attendees – Severe Weather Briefings			
Date of Briefing:			
Briefing Carried Out By:			
Name	Signature	Organisation	Position Held

Feedback and Action Planning from Exercises and Briefings

Service Provider must capture the outputs and actions from exercises and briefings into action plans / reports and submit to the Service Manager and to the National Winter and Severe Weather Team via email winterteaminbox@highways.gsi.gov.uk. This will ensure issues can be considered for inclusion in the National Severe Weather Programme. A sample template for the 'Summary of Actions' is provided below.

Service providers may capture this information within a Severe Weather Action Plan (SWAP) as an alternative document, and make this available for review.

Service providers and attendees may be asked to complete a short online survey. Details will be provided within the guidance note and will replace the need for any information to be provided within the Operational Assessment Reports.

Summary of Actions – Severe Weather Briefings					
Ref	Category	Summary of Issue / Finding	Proposed Action required	Owner	Date to Action

B.3 WEATHER INFORMATION

The Service Provider requires a robust information system to provide it with accurate real-time data on both weather forecasts and actual road conditions. The road weather forecasting service to be procured by the Service Provider, is detailed below.

Weather forecasting

For the avoidance of doubt, there will be no bureau, transmission, service or data management fees incurred by organisations sending, receiving or viewing data provided via HAWCS.

The name of the forecast provider, forecaster, the date and the time of issue must be recorded with all forecasts. All forecasts shall advise validity as a start date/time and end date/time.

Frequency and intensity of forecast information

Field	Frequency	Data Intensity
Morning Summary	06:00 Daily	Single Field
24 Hour Forecast (Text)	Operational Winter Period: 06:00, 12:00 and 18:00 Daily Operational Summer Period: 06:00 Daily	Single Field
24 Hour Forecast (Domains)	Operational Winter Period: 06:00, 12:00 and 18:00 Daily Operational Summer Period: 06:00 Daily	For each domain, daily.
2-10 Day Forecast	12:00 Daily Operational Summer Period: 06:00 Daily	Day 2 to 5 – Area based, daily Day 6 to 10 – Single Field
Site Specific Forecast	Operational Winter Period:12:00 Daily Operational Summer Period: None	For each domain, hourly.

The parameters forecast will vary between the Operational Winter and Summer Periods. The following table details which forecast parameters are to be provided.

Forecast Parameter	Winter	Summer
Minimum road surface temperature	✓	×
Maximum road surface temperature	×	✓
Minimum air temperature	✓	×
Maximum air temperature	×	✓
Dew point / Relative humidity	✓	×
Surface state	✓	×
Wind speed (various)	✓	✓
Wind direction	✓	✓
Accumulations of snow (depth)	✓	×
Visibility	✓	✓
Pollen count	×	✓
UV factor	×	✓
Snow level (ht above sea level)	✓	×
Hazard – Ice	✓	×
Hazard – Heavy Rain	✓	✓
Hazard – Freezing Rain	✓	×
Hazard – High Temperature	×	✓
Hazard – Hoar frost	✓	×
Hazard – Fog	✓	✓
Hazard – Snow	✓	×
Alert Level	✓	×

24 Hour Forecast

The 24 hour forecast consists of two parts; a 24 hour text forecast and a domain forecast in tabular format. During the Operational Winter Period a detailed 24-hour text forecast and a domain forecast should be updated and delivered at 06:00, 12:00 and 18:00.

During the Operational Summer Period a detailed 24-hour text and domain forecast shall be updated and delivered daily at 06:00 covering the 24-hour period from 06:00 to 06:00.

Additional optional elements can be included at the request of Service Providers. These may include:

- Extension of forecast periods from the forecast issue time up to thirty six hours ahead;
- Addition of a 00:00 text forecast;

Text Forecast

The 24 hour text forecast will be valid for the ensuing 24 hour period from the prescribed issue time.

The text of this forecast must include:

- Headline weather description
- A general synopsis, with timings, over the following 24 hours, including:
    - Summary of the meteorological synoptic situation with timings of significant meteorological changes during the forecast period with particular reference to hazards such as snow, ice, hail, hoarfrost, freezing rain (including supercooled and rain falling on frozen surfaces), wind, fog, lightning and rain/showers which are expected to affect any of the agreed HAWIS forecast domains.
    - Expected road surface conditions indicating whether roads are likely to be dry or wet.
    - Onset, duration and intensity of hazards such as rain, hail, sleet, snow, rain falling on frozen surfaces and freezing rain, including potential accumulations of snow on road surfaces described in centimetres (assuming no treatment has been undertaken).
    - Relative humidity and dew point, including a warning of any predicted combination of low temperature and low humidity conditions (less than 60%).
    - The likelihood and timing of any precipitation or deposition on road surfaces and the likelihood of surface water on the carriageway.
    - If snow is forecast, its timing, amount and type and the direction from which the snow will develop, the likelihood of drifting and the height above which accumulation is likely.
    - Visibility – danger of thick fog (<1000 m visibility) or freezing fog formation, the location and timing.
    - UV factor and pollen count.
- Average wind speed, direction and maximum gust speed at six hour intervals from the time of forecast.
- General confidence level in the forecasts (low, medium or high as per following table)
- General alert level

Level 0 (Green)	There are no expected hazards on the road surface and road surface temperatures are expected to be above +1°C when confidence is high or above +2°C for all other occasions.
Level 1 (Amber)	• Road surface temperatures are expected to be between +1°C and +2°C when the confidence is low. • Road surface temperatures less than or equal to +1°C and greater than or equal to zero. • Road surface temperatures below zero but road surfaces are expected to remain dry.
Level 2 (Red)	Road surface temperatures are expected to be below zero and road surface hazard(s) exist. Road surface hazard include ice, snow, freezing rain and hoar frost.

Domain Forecast

The domain forecast will have a variable validity period as follows:

Winter Operational Period

- 0600 domain forecast validity period will be 1200 to 0600
- 1200 domain forecast validity period will be 1200 to 1200
- 1800 domain forecast validity period will be 1800 to 1200

Summer Operational Period

- 0600 domain forecast validity period will be 0600 to 0600

By domain, the following information shall be provided, where appropriate including an indication of confidence level as High, Medium and Low and the period of occurrence (including zero crossing point):

- Minimum and maximum road surface temperature
- Minimum and maximum air temperature
- Accumulation of snowfall on road surfaces and height above sea level
- Occurrence of ice, heavy rain, high wind, freezing rain, high temperatures, hoar frost and fog
- Alert level

Additional optional elements can be included at the request of Service Providers. These may include:

- Urban/rural road surface temperatures
- Bridge deck temperatures

2-10 Day Forecast

A 2-10 day forecast must be obtained with the 24-hour forecast. The first element of this forecast must detail anticipated conditions in 24-hour periods for days 2-5. The 24 hour periods must be 1200 to 1200 during the Winter Operational Period and 0600 to 0600 during the Summer Operational Period. The parameters to be forecast will differ between the Summer and Winter Operational Periods and should comply with the table on page B.2-2. The forecast must include:

- A general synopsis and anticipated trends over the period with particular emphasis on the following hazards: Hoar frost, ice, snow, drifting, freezing rain, rain falling on frozen surfaces, heavy rain, fog and strong wind.
- Daily general alert level
- Maximum and minimum road surface temperatures
- Maximum and minimum air temperature
- Occurrence of snow, ice, heavy rain, high wind, freezing rain, high temperatures, hoar frost and fog
- UV Factor
- Pollen count
- Confidence level in the forecasts (low, medium or high)

A second, text element of this forecast must also include a general synopsis and anticipated trends over the 6-10 day period with particular emphasis on the following hazards: Hoar frost, ice, snow, drifting, freezing rain, rain falling on frozen surfaces, heavy rain, fog and strong wind.

Site Specific Forecasts

Detailed 24-hour site specific forecasts must be delivered between 12:00 and 14:00 for all primary environmental sensor stations. These forecasts apply for the Operational Winter Period and must include on an hourly basis:

- Road surface temperature
- Air temperature
- Dew temperature
- Surface state

Additional optional elements can be included at the request of Service Providers. These include:

- Wind speed
- Rain state
- Cloud state
- Cloud amount
- Textual site specific forecasts

Further Updates of Forecasts

Forecast updates apply to 24-hour forecasts and site specific forecasts. Whenever a change to any forecast occurs the text forecast will also be re-issued with explanatory notes in the headline along with any other associated changes to the forecast.

In the event of the update criteria being met the procedure shall be to notify the client immediately whenever the change will have an impact on proposed salting operations then re-issue the amended forecasts as appropriate. Notice shall be provided by telephone to the client no more than 1 hour following the criteria being met and the updated forecast shall be issued within a further hour. Updates should only be issued between 18:00 and 06:00 or during the overall hazard period; however the following shall apply in all cases:

The forecast provider shall take note of proposed Service Provider actions and in the event of a weather forecast changing or actual weather occurring that could result in a change of action by the Service Provider, the Forecast Provider shall take appropriate action to inform the Service Provider in advance of the changed weather forecast.

The suggested standard update criteria are as follows:

- A change in the forecast or an actual event occurring that could result in a change in the action taken by the client. This includes changes such as:
    - When hazardous conditions are sufficiently more intense or the timing has changed by two or more hours which, in the forecast provider's opinion, may impact on salting operations.
    - When road state changes or snow, ice, heavy rain, high wind, freezing rain, high temperatures, hoar frost and fog are present when they have not previously been forecast.
    - A road surface temperature crossing either the 1°C or 0°C threshold two hours earlier than previously forecast or when not previously forecast to do so.

- A significant difference in any precipitation forecast which, in the forecast provider's opinion, may affect the salting times, e.g. showers lasting later into the evening than originally forecast.

- A significant change in any snow forecast, e.g. a change in timing, intensity, accumulations or the level to which it will fall.

- When the actual road surface temperature is between plus 5°C and 2°C or 0°C and minus 5°C, if the forecast and actual road surface temperature deviates by 2°C or more for a sustained period of more than 1 hour.

- When the actual road surface temperature is between plus 2°C and 0°C, if the forecast and actual road surface temperature deviates by 1°C or more at any point.

In addition, exceptions to normal practice are as follows:

- In the event of forecast winter hazard, such as frost, ice or snow, during the Operational Summer Period the 24-hour forecast, domain forecast and site specific forecast will revert to that of the Operational Winter Period

In the event of a primary forecast site failing for a period of over a month, the Forecast Provider shall transfer forecast provision to the secondary environmental sensor stations within the climatic domain.

Morning Summary

A morning summary must be issued between 05:00 and 06:00. The text of this report should include:

- A brief summary of weather experienced over the previous 24 hours
- Notification of any suspected faults in the Highways Agency Weather Information Service.

Traffic Officer Service Requirements

Some mandatory and optional elements of the service may be required by the TOS in the delivery of their duties. This information will be provided, where available, through HAWCS. The Service Provider shall therefore liaise with the TOS to identify any optional requirements they need for the Service Manager to consider.

24 Hour Consultancy Service

The Service Provider shall ensure that the Forecast Provider is available by telephone 24 hours a day, 7 days a week, 365 days a year (including leap years) for consultation on the weather conditions and details of forecasts. The Service Provider should ensure that the Forecast Provider provides a response within five minutes of any Service Provider enquiry.

End of Season Analysis

At the end of each Operational Winter Period, the Service Provider must ensure that the Forecast Provider produces an Operational Assessment Report. This report will include details on the accuracy of forecasts based on information contained in HAWIS. For each forecast site, this analysis must include:

- A graphical representation of actual versus forecast minimum road surface temperatures
- A graphical representation detailing the frost prediction accuracy by comparing forecast frost against actual frost conditions (i.e. frost/frost, frost/no frost, no frost/frost or no frost/no frost)
- The bias and root mean square error in the forecast of minimum road surface temperature.
- Outline of lessons learned and particular successes from the previous season.

The Service Provider will retain copies of the analysis and make them available to the Highways Agency if required.

Level of Accuracy

The accuracy of weather forecasts is fundamental to their usage in road weather forecasting, especially when applied to the Operational Winter Period. This section defines the measures that should be recorded and target results. The responsibility for ensuring the forecast supplier is meeting accuracy targets is with the Service Provider.

The terms below should be used as defined terms for the purposes of measuring accuracy consistently:

- e = Error between the coldest actual road surface temperature and the associated forecast road surface temperature
- n = Number of nights within the forecast period
- FF = Number of occasions where a frost was forecast and frost occurred (accurate)
- FNF = Number of occasions where a frost was forecast and no frost occurred (potential wastage)
- NFF = Number of occasions where no frost was forecast and frost occurred (potential risk)
- NFNF = Number of occasions where no frost was forecast and no frost occurred (accurate)
- A critical night is a night where the actual road surface temperature in degrees centigrade falls within the range: $-5 \leq T \leq +5$
- A frost on this occasion is deemed to occur when the forecast or actual road surface temperature is at or below 0°C.
- The final forecast is either the 18:00 forecast, or any ad-hoc forecast prior to 00:00.

The accuracy measures shall be:

- Percentage of forecasts not delivered before the target time, including ad-hoc forecasts within prescribed timescale for delivery following identification.
- Number of phone calls not answered by a forecaster within 5 minutes
- Route Mean Square Error
    - The Route Mean Square Error (RMSE) is to be assessed on all nights based on initial forecast and final forecast.
    - The equation for calculating the RMSE is: $\left[\frac{1}{n}\sum_{i=1}^{n} e_i^2\right]$
    - Performance should be as close to 0 as possible, and should generally be less than 2.
- Bias
    - The bias is to be assessed on all nights based on initial forecast and final forecast.
    - The equation for calculating the bias is: $\left[\frac{1}{n}\sum_{i=1}^{n} e_i\right]$

- Performance should be as close to -0.25 as possible, and should generally be in the range +1 to -1.

- Probability of Detection
  - Probability of Detection (PoD) is to be assessed on all nights, and also just critical nights. PoD should be assessed on initial forecast and final forecast.
  - The equation for calculating PoD is: $\left[\frac{FF}{(FF + NFF)}\right]$
  - Performance should be as close to 100% as possible, and should not be less than 87%.

- False Alarm Rate
  - False Alarm Rate (FAR) is to be assessed on all nights, and also just critical nights.
  - The equation for calculating FAR is: $\left[\frac{FNF}{(FF + FNF)}\right]$
  - Performance should be as close to 0% as possible, and should not be more than 30%.
  - FAR should be assessed on initial forecast and final forecast.

- Accuracy
  - Accuracy is to be assessed on all nights, and also just critical nights. Accuracy should be assessed on initial forecast and final forecast.
  - The equation for calculating accuracy is: $\left[\frac{(FF + NFNF)}{(FF + NFNF + FNF + NFF)}\right]$
  - The accuracy of road weather forecasts should be no less than 90%.

Occasions where less than one observation per hour for ten out of twelve hours between 18:00 and 06:00 will not be included in calculations. For periods where a potentially faulty sensor has been identified these may be discounted from the calculations providing a fault report has been raised with the HAWCS Provider.

Precipitation Radar, Satellite Images and Forecast Mapping

HAWIS will make the following services available to all users. The information has been procured centrally via the Met Office.

- Precipitation Radar
  - Actual (current and historic) radar will be available for the previous 2 hours with images at five minute intervals. Forecast radar images will be available for the coming 6 hours with images at 1 hour intervals. The images will show the intensity of precipitation and provide an indication of whether the precipitation will fall as rain, freezing rain, snow or sleet.

- Satellite Images

- Visible light and infrared images for the entire UK, displayed on a mapping system. The images from the previous 2 hours will be available at fifteen minute intervals.

- Forecast Mapping
    - Synoptic charts / forecast mapping showing pressure (including an indication of weather fronts and areas of low or high pressure), precipitation, wind speed/direction and fog risk. Visibility, wind speed and wind direction forecast maps will be available at 3 hour intervals for the upcoming 36 hours, updated every 6 hours. Surface pressure / weather front forecast maps will be available at 12 hourly intervals for the upcoming 84 hours.

The above descriptions are the minimum information to be provided. The Service Provider will consider the information available via HAWIS and if more detailed, or alternative, information is required this should be procured by the Service Provider. Any additional forecast imagery will not be displayed via HAWIS therefore arrangements will be required to access it via the forecaster provider's website.

Network Based Forecasting

Network (or route) based forecasting is an emerging technology in highway forecasting. As a tool it provides a facility similar to thermal mapping, however as forecasts are generated at a far greater intensity (typically every 50-100m) the level of detail provided to decision makers is far greater.

Service providers may procure network based forecasting however all standard forecast requirements must still be met. Not all aspects of network based forecasting can be displayed by HAWIS. Where a Service Provider procures a network based forecast service, the domain forecast will be populated with each route as a separate domain. Arrangements should be made to access the remaining network based forecast information via the forecast provider's website.

Forecast Providers shall continue to provide weather forecasts for primary environmental sensors sites to enable data accuracy assessments.

Forecast Resilience

To provide resilience in the unlikely event of HAWIS being unavailable, the Service Provider will ensure they have arrangements in place to receive forecasts by alternative means. This may be via email, fax or the forecast provider's own website.

B.4 ANTI-ICING/DE-ICING MATERIALS

Whatever anti-icing / de-icing material is selected the Service Provider must ensure Area Operational Winter Service Vehicles (including Reserve Vehicles) are calibrated for the anti-icer / de-icer to be spread, taking into account the moisture content and grading. Checks of both spread rate and profile (skew / distribution) throughout the Operational Winter Period are encouraged to confirm that Winter Service Vehicles are spreading correctly.

Salt

Although pre-wetted salting is the Highways Agency's preferred treatment dry salting still provides an effective reactive treatment should ice have formed or snow settled. It is also considered an acceptable treatment where Winter Service Vehicles capable of pre-wetted salting are not available.

Rock salt should be treated with an anti-caking agent before delivery and comply with the current British Standard (BS 3247:2011). 6.3mm down is the preferred gradation for use on the Network for pre-wet or dry treatments. If salt of that grading is not available either 10mm rock salt or 6-8mm marine salt make for effective alternatives, although Service Providers should remain mindful that the latter may contain stones exceeding 10mm that might pose a problem.

Trials have shown that an acceptable distribution can be achieved for both the 10mm salt and the 6-8mm marine salt using the standard settings for 6.3mm rock salt, although calibration for the different gradation is recommended. Standard spread rates may be utilised. Although the Schmidt and Romaquip spreaders have a controller option to spread 6-8mm marine salt this has not been calibrated. Although the marine salt is purer that indigenous rock salt, meaning more sodium chloride (NaCl) is delivered to the road, reductions to spread rate are not considered appropriate.

Salt storage

Salt should be stored in barns or covered in protective sheeting in a manner that avoids the ingress of moisture into the material as far as is practicable. Salt must not be stored within 4.5m of hedges or within the rooting area of trees. The Service Provider must ensure salt stockpiles do not become contaminated with foreign matter likely to cause damage to other road users and / or the Winter Service Vehicles.

The Service Provider will monitor the moisture content and gradation of particles in the stockpile on a regular basis to confirm that the salt remains in an acceptable condition. Details of such monitoring must be recorded. Salt handling during storage must be minimised as it can cause salt loss and particle breakdown.

As salt is removed from stockpiles a safe slope on the material must be maintained to protect operatives from the risk of collapse of the stockpiles. Exposed outdoor stockpiles should be formed into the shape of long rectangles.

Careful consideration will be given to drainage to prevent pollution. Guidelines on this are available within the Environment Agency's "Pollution prevention guidelines highway depots: PPG10". The Service Provider must consider using any recycled wash water, salt laden drainage and other salt containing liquids as part of a pre-wet or liquid brine treatment regime.

Salt Stock

Under the AMOR, Minimum Contractual Salt Stock Levels have been calculated for each Area, these are summarised in the following table. If AMOR specification is not in place, either through tender or negotiated route for the area concerned, salt stocks will be proposed by the Service Provider for acceptance by the Service Manager. Regular completion and submission of the Salt Capability Spreadsheet, which calculates Minimum Capability, will facilitate early identification and appropriate escalation of any difficulties that emerge in individual areas relating to the supply

of salt. The Service Provider must set an appropriate Reporting Threshold, which considers all known risk to salt supplies. This level is not prescribed, as it is dependent upon local circumstances.

Area	Current Maximum Storage Capability (t)	Minimum Operational Salt Stock Levels at Start of Season* (t)	Minimum Contractual Salt Stock Level (t)
1	10,670	10,300	3,513
2	22,900	20,420	7,281
3	30,000	25,000	7,765
4	21,500	18500	6,109
6	12,300	9,650	4,900
7	24,700- 28,700**	24,000	5,713
8	11,600	11,374	3,981
9	47,250	35,000	12,250
10	26,630	24,430	7,909
12	25,288	23,000	8,282
13	20,600	15,958	3,878
14	12,200	12,200	4,206
Total			75,787

Current maximum and minimum operational salt stock levels details are taken from latest restocking plan

*** once Rothersthorpe new barn is completed*

DBFO Companies should insert their contractual minimum salt stock levels into the table as per their contract.

Brine

Recent research identified that pre-wet spreaders are able to spread brine if the spreader is set up to do so, this may require modification of the current software to bypass the solid de-icer distribution on some vehicles. Service Providers should contact the spreader manufacturer for instructions on how to set up pre-wet spreaders to spread brine with solid de-icer in the hopper. The guidance included here is for making use of this additional benefit from those spreaders and is not solely for the benefit of Service Providers with liquid spreaders.

Brine is effective immediately after spreading and unlike solid de-icers can reduce the risk of ice formation without the need for trafficking, though can be more susceptible to wash-off after rain. Therefore, brine may be considered for an additional top-up treatment, to help activate solid de-icers, for areas with little or no traffic such as lightly trafficked slip roads and for lanes that are only trafficked for parts of the day, e.g. LBS1 of Smart Motorways.

In addition, brine may be considered as a top-up treatment option in low temperature low humidity conditions, where solid de-icers, especially dry salt and to a lesser extent pre-wetted salt, may not dissolve and become effective. The use of brine as a top-up treatment will not be subject to the treatment time requirement.

The salt concentration of the brine has a greater influence on the amount of salt on the carriageway when spreading brine compared to pre-wet salt. This is because pre-wet comprises a 70:30 ratio of dry salt: brine therefore; the dry salt component is the major contributor to the salt

on the carriageway. For a brine only treatment a brine concentration of 20% means the amount of salt on the carriageway is reduced by 13%, compared to spreading a brine concentration of 23%. It is thus recommended that brine of the 23% optimum concentration is used.

The ability of the pre-wet spreaders to spread brine, without modification to the spinner, is limited by the capacity of their brine pump meaning a maximum spread rate of approximately 40g/m^2 to a single 3.6m wide lane or 20g/m^2 to two lanes of total width 7.2m. Assuming a brine concentration of 23%, this equates to a nominal dry salt spread rate of 9.2g/m^2 and 4.6g/m^2, respectively. Table B.1 illustrates the length of route that can be treated with brine using pre-wet spreaders, assuming a carriageway width of 3.6m.

Table B.1 Approximate length of route that can be treated with brine using pre-wet spreaders

Spreader	**Length of treatment (km) assuming 3.6m wide carriageway**			
	Nominal spread rate = 20g/m^2		**Nominal spread rate = 40g/m^2**	
	1 Lane	**2 Lanes**	**1 Lane**	**2 Lanes**
6x4 pre-wet	50	25	25	12.5
4x4 pre-wet	33.3	16.7	16.7	8.3

Brine spreading is likely to be more susceptible to the effects of wind than pre-wetted salting. It is essential that careful consideration be given to the surface condition as the presence of moisture will dilute the brine application or the residual salt present on the surface. After rainfall, untrafficked areas are likely to remain wetter for longer than trafficked areas. Furthermore, many hard shoulders are on the low side of crossfalls so large areas of carriageway can drain over them.

Consideration must be given to possible differences in temperature between LBS1 of a Smart Motorway and the running lanes of the carriageway. The temperature in Lane 3 of a three lane motorway can be up to 3°C lower than Lane 1 because of the lighter traffic flows. Without the traffic the temperature difference can be even greater such that an untrafficked hard shoulder can be up to 5°C lower than Lane 1; this is particularly evident on concrete carriageways. Similar temperature differences may be evident on slip roads.

Where accurate information is available on surface temperature and surface conditions appropriate brine spread rates may be determined using Table 5.5.2 below. It shows the minimum road surface temperatures at which freezing will not occur for brine spread rates of 20g/m^2 and 40g/m^2. It should be noted that the accuracy of spread, when using pre-wet spreaders for brine spreading, reduces when treating two lanes and the table accounts for this.

Table B.2 Effectiveness of brine treatments

Water Film Thickness (mm)	Lane(s) Spread and Nominal Brine Spread Rate		
	1 at 40g/m^2	**1 at 20g/m^2**	**2 at 20g/m^2**
	Minimum road surface temperature at which freezing will not occur (˚C)		
0.05 (Damp)	-5.9	-3.6	-2.9
0.1 (Wet)	-3.6	-2	-1.7

The water film thicknesses in Table B.2 apply when a road is lightly trafficked. If there is no traffic, the water film thickness may be higher in frost conditions and after rainfall. A doubling of the water film thickness will approximately halve the minimum road surface temperatures shown above. However, if more water is present solid de-icers from previous treatments are more likely to dissolve to work with the brine to help prevent ice formation. Where accurate information is not available, especially if ice formation is suspected, it is recommended that top-up treatments are made at the maximum spread rate that can be achieved with pre-wet spreaders, namely 40g/m^2 for one-lane spreading and 20g/m^2 for two-lane spreading.

Brine Storage

Brine may be obtained and delivered pre-mixed from suppliers and stored in an appropriate tank or manufactured on site using a saturator or salt station. The use of a pure white salt (typically greater than 98.5% NaCl, e.g. marine salt) within saturators is recommended. The optimum, and recommended maximum, concentration for sodium chloride brine is 23%. Lower concentrations in excess of 20% are acceptable for pre-wetting treatments. To avoid variations in concentration due to stratification in the storage tanks the solution must be mixed thoroughly. Service providers are recommended to drain and flush the brine tanks on spreading vehicles to prevent segregation and crystallisation, which may occur if tanks are left full for some time.

It is prudent to make regular checks of brine concentration, for example by checking the density of the solution calculated by simple weighing of a known volume or by using a measurement instrument (salinity refractometer or salt hydrometer) to give a specific gravity, to ensure the concentration is as required. For a concentration of 23% the density at 15°C will be 1176 kg/m^3 (or specific gravity of 1.176). Slight adjustments are required for densities measured at temperatures other than 15°C.

Pre-wetted salt

Pre-wetted salt is accomplished by wetting dry salt (at a ratio of 30% pre-wetting agent to 70% dry salt, by weight) before application to the road surface. The pre-wetting agent is usually a solution of Sodium Chloride although a solution of Calcium Chloride ($CaCl_2$), Magnesium Chloride ($MgCl_2$) or a Sodium Chloride brine with ABP additive) may be alternatives for extreme temperatures (see below).

Alternative Anti-icing/De-icing Materials

Alternative anti-icing/de-icing materials are usually more expensive than salt. It is anticipated that any use of an alternative anti-icing/de-icing material will be restricted to isolated, specific circumstances (e.g. structures susceptible to corrosion) or when salt treatment are not fully effective (e.g. during extreme cold conditions – see Appendix B.6). Alternative anti-icing/de-icing materials that may be considered are summarised in the table below.

National Winter Service Research Group (NWSRG) have developed guidance for the use of alternative treatments in extreme cold. Pertinent parts of that guide have been included within the Severe Weather Plan for ease of reference including treatment matrices for spreading materials in conjunction with rock salt. (see Section 7)

Material	Cost*	Action/Effectiveness	Environmental Effects	Health & Safety
Calcium Chloride (Solid or Solution)	X20	Effective down to -31°C, but can leave oily residue resulting in slippery surfaces.	Corrosive to steel and aluminium. Damaging to vegetation	Potential irritant to skin eyes and respiratory tract Special storage requirements due its hygroscopic nature
Magnesium Chloride (Solid or Solution)	X20	Effective down to -15°C	Potentially damaging to concrete. Damaging to vegetation.	Potential irritant to skin eyes and respiratory tract
Calcium Magnesium Acetate (Solid)	X50	Effective down to -9°C, but less effective than salt below -5°C and requires a greater application rate.	Effectively non-corrosive compared to salt Relatively environmentally benign	Gloves and eye protection are recommended
Potassium Formate (Solution)	X20	Effective down to -15°C	Moderately corrosive to galvanised steel. Slightly lower Biological Oxygen Demand (BOD) than acetates less harmful to groundwater than salt	Overexposure may cause skin or eye irritation or skin rash
Propylene Glycol (Solution)	X40	Effective down to -15°C May have slight adverse effect on skidding resistance	Moderately corrosive to galvanised steel. High BOD and Chemical Oxygen Demand (COD) can be damaging to water systems	Ensure adequate ventilation; avoid breathing vapour, mist or gas; avoid contact with eyes, skin and clothing; and wash after handling
Potassium Acetate (Solution)	X20	Immediate action Effective for up to 48 hours to - 15°C in suitable weather conditions	Effectively non-corrosive compared to salt Safe to aquatic life Biodegradable	Gloves and eye protection are recommended Solutions are safe to handle
Urea (Solid)	X25	Requires agitation by traffic Effectiveness: 10% solution to -3°C 25% solution to -7°C Little worthwhile effect below -7°C and ineffective below -11.5°C Remains effective for up to 12 hours in fair weather but repeat applications need to be more frequent in rain or strong winds.	Non-aggressive, but may produce ammonia and carbon dioxide. Ammonia is toxic to aquatic life. Ammonia further decomposes to nitrate which, promotes growth of vegetation, and creates an oxygen demand. Urea solutions may be detrimental to steel, plastics and concrete in some circumstances. Vehicles should not be left full of urea for any length of time, and thoroughly washed down after use.	Ventilation, due to ammonia Safe to handle but the pellets break into powder easily which becomes very slippery due to its high hygroscopic nature. Face masks and eye protection are recommended When heated to melting (i.e. fires) urea decomposes to form toxic substances. Only trained fire fighters, properly equipped with breathing apparatus should attempt to deal with fires in urea stores. Local fire fighting services should be informed of urea stock sites.

*Approximate cost compared to rock salt

The use of urea on the Network has generally been phased out due to the associated safety and environmental considerations. However, urea dampened sharp sand may be considered for use in the event of a salt crisis. If sand is used the treated section should be swept and the drainage gullies emptied, as soon as reasonably practicable.

B.5 DEPLOYMENT OF RESERVE WINTER SERVICE VEHICLES

1. Service Providers are required to monitor the issue of Area Operational Reserve Winter Service Vehicles within their jurisdiction.

   Service Providers may use 100% of the Area Operational Reserve Winter Service Vehicles allocated to them to cover for breakdowns EE Vehicles etc. without approval from the HA but must ensure they are notified. They are therefore required to record the issue of each Operational Area Reserve Winter Service Vehicle on the WRF1 System (Near to Real-time – within 30 minutes).

2. If the Area Reserve Threshold has been reached the Service Provider must consider whether the situation requires National Reserve Winter Service Vehicles to be deployed.

3. The Service Provider must notify the National Winter Co-ordinator by e-mail at paul.furlong@highways.gsi.gov.uk if the situation is not considered to require the deployment of National Reserve Winter Service Vehicles. The Service Provider and National Winter Co-ordinator should then continue to monitor the situation in-case it escalates to a level that requires the deployment of National Reserve Winter Service Vehicles.

4. The Service Provider must notify the National Winter Co-ordinator by text or phone on 07917559156 if it is felt that the situation requires the immediate deployment of National Reserve Winter Service Vehicles. The National Winter Co-ordinator will also be available out of hours, but should not be contacted by phone unless it is felt that the situation will require the deployment of National Reserve Winter Service Vehicles. Should the National Winter Co-ordinator not be available, National Reserve Winter Service Vehicles may be used in an emergency situation, with all details recorded via email to the National Winter Co-ordinator, together with attempted time and method of contact.

5. The National Winter Co-ordinator will make a decision on the logistics for deployment of National Reserve Winter Service Vehicles based on discussions with the Service Provider(s) and Regional Performance Manager(s).

6. If the situation becomes a Critical Incident, the National Winter Co-ordinator will liaise with the appropriate regional/national incident commander (under the improved coordination process) to ensure that any emerging incident is governed appropriately.

7. National Reserve Winter Service Vehicles that are no longer needed are returned to their operational centre and the WRF1 Reporting System updated accordingly. National Reserve Winter Service Vehicles are issued for specific tasks and may be withdrawn for re-deployment elsewhere should the need be greater.

8. National Reserve Winter Service Vehicles are also available to DBFO Cos, but must be operated by drivers that have received certified training. When National Reserve Winter Service Vehicles are required, contact must be made with the National Winter Co-ordinator who will then arrange for their deployment. The service provider that normally holds the deployed National Reserve Winter Service Vehicles in their Area is responsible for recording the issue on the WRF1 system.

Area	Total Area Operational Winter Service Vehicles (inc Operational Reserve)	No. National Reserve Winter Service Vehicles	Total Winter Service Vehicles	No. Snow Blowers
1	19	1	20	0
2	38	2	40	2
3	41	2	43	1
4	30	2	32	3
6	31	2	34	0
7	45	2	47	2
8	27	2	29	0
9	59	2	61	3
10	43	2	45	4
12	35	2	37	3
13	28	0	28	2
14	19	2	21	3
TOTAL Highways Agency Owned Vehicles			**437**	**23**

For those contracts where the Highways Agency does not supply vehicles, for example DBFO contracts, the Service Provider should amend the table to detail the vehicles to be provided to deliver the service.

B.6 SPECIAL CONSIDERATIONS

Network Features or surfacing that have a thermal response that is very different to the majority of the road network may require special consideration with regard to Winter Service. In addition, certain weather conditions require special consideration. This annex highlights some Network Features and the effects of various weather conditions on Winter Service treatments which Service Providers must be mindful of.

Network Features

Negatively textured surface courses

Carriageways with negatively textured surface courses require special consideration with regard to residual salt, as much of the salt is retained in the voids 'negative texture'. The brine trapped in the pavement voids is reliant upon the action of tyres over the surface to withdraw it to the road surface which is influenced by traffic levels. On a heavily-trafficked carriageway, a reasonable degree of residual salt will be "plucked" out so as to remain on the surface of the carriageway to combat the formation of ice. On lightly-trafficked carriageways the brine is retained in the voids.

Operational experience has indicated that negatively textured surface courses do not benefit from an increase in dosage above that required for hot rolled asphalt. Negatively textured courses should be treated with caution and residual material should not be relied upon to provide protection.

Porous asphalt

Porous asphalt has different thermal characteristics, meaning it cools more rapidly and warms slower, than dense surfacing. Compared with that of dense road surfaces it will typically fall below freezing point an average of half an hour earlier and rise above freezing point an average of an hour later. In extreme weather conditions (little winds, clear skies) the surface temperature is about 1°C lower than that of comparable dense surfacing.

For heavily trafficked roads the behaviour of porous asphalt surfacing barely differs from that of dense road surfaces. At low traffic intensities the loss of thawing agent into the voids of porous asphalt results in a greater likelihood of freezing of light precipitation (condensation, freezing fog) and greater quantities of treatment material being required to treat heavy precipitation. Target spread rates for porous asphalt are recommended to be plus 25% of the selected treatment.

Care needs to be taken at interfaces between porous asphalt and dense road surfacing because the horizontal transport of the treatment material is limited from the porous asphalt. The initial length of dense surfacing can have a reduced amount of treatment material as a consequence.

Poorly drained areas with the potential to re-freeze

Particular attention must be paid to lengths of road that are known to be susceptible to 'run-off' water from verges or central reserves and at joints between porous and impermeable surfacing. Efforts should be focussed on addressing the drainage problems, given very significant quantities of salt are required to prevent ponded water from freezing. Although the road itself may be dry, accumulations of snow may melt then run onto the road and re-freeze.

Similarly, care must also be taken when considering stockpiling snow adjacent to solid vertical barriers. There is the risk of melt water running across the carriageway with the possibility of it re-freezing.

Solid Vertical Barriers

The presence of solid vertical barriers (SVBs) can present operational difficulties to snow ploughing which will potentially result in snow being stacked on lanes adjacent to them. The Service Provider must consider whether any lanes may need to be abandoned during heavy

snow whilst keeping the maximum number of lanes available to traffic and maintaining access and egress. Stacked snow must be removed at the earliest opportunity.

Traffic calming features

Caution must be exercised when planning ploughing operations in the vicinity of traffic calming features. The range of traffic calming measures that may be of concern to ploughing operations include:

- Speed cushions
- Two-way chicanes
- Central refuges
- Traffic islands
- Road narrowing
- Over-run areas
- Rumble strips

Low Temperature / Low Humidity Vulnerable sites

The location of vulnerable sites must be plotted on a map of the Network using data compiled of past incidents where the conditions were considered a contributing factor to the incident and / or other network intelligence (including sites identified as being at risk of problems – see 1.6.4) and the associated location. Information comprising the following elements must be recorded for each site:

- Site location (slip road, main carriageway, sharp bend)
- Accident record (highlighting weather related events)
- Surfacing type and condition
- Climatic, geographical or other features which may affect the temperature relative to the surroundings or the performance of the anti–icing agent (e.g. the site is sheltered, in a hollow, North facing, elevated, shaded by trees, in a cutting, has a high cross fall, low traffic volumes, lanes that are not trafficked for parts of the day)
- Spreading route length affected

Weather Conditions

Cross-winds

Cross-winds can affect the distance over which treatment is spread and to compensate it may be necessary to spread from a lane upwind (if appropriate) from that normally chosen. In exceptionally strong winds, it may be necessary to undertake a second treatment run with the spreader set asymmetrically into the wind.

Effectiveness of Salt after Rain

Spreading salt while the road surface is wet will dilute the brine formed meaning it may not be sufficiently concentrated to prevent ice forming. Table B.1 illustrates this showing how much the freezing point of water can be depressed with an $8g/m^2$ precautionary pre-wetted salt treatment for various water film thicknesses.

Table B.1 Effect of 8g/m^2 Pre-Wetted Salt Treatment on Freezing Point

WATER FILM THICKNESS (mm) [Surface Condition]	**FREEZING POINT (°C)**
0.03 [Dry / damp – well trafficked]	-4.7
0.05 [Wet – well trafficked]	-2.9
0.1 [Wet – lightly trafficked]	-2.0

Treatments should be delayed as long as practically possible after rainfall to enable trafficking to disperse surface water, which it can quickly do after rainfall ceases especially on well drained surfaces, so spray is minimal. If freezing is forecast after heavy rainfall, where trafficking cannot significantly reduce the water at the road surface successive treatments must be conducted.

The definitions of what constitutes a wet or damp road for Winter Service are:

- a wet road is one where minimal spray is evident and there is no water flowing across the surface
- a damp road is one where water is present that clearly darkens the road surface, but there is no spray or water flowing across the surface

Re-treatments must be considered after rainfall given salt can be washed from the road, reducing any residual salt effect.

Freezing Rain

Freezing rain in this country is a rare, but exceptionally dangerous phenomenon. It occurs when rain falls through a layer of very cold air, where it becomes super cooled (remaining a liquid below the usual freezing temperature). The rain freezes immediately on contact with a surface forming “black ice”. The black ice can build up very quickly completely covering the road surface (since freezing on contact does not allow run-off). Service providers must ensure their forecast provider uses the term “freezing rain” for such super cooled rain, rather than to describe cold rain falling on frozen surfaces – although such cold rain can result in rapid icing (especially when surfaces are extremely cold), pre-treatments provide for a more effective treatment for that condition.

The nature of freezing rain means that ice will form on the carriageway and that preparations for the freezing rain will not prevent incidents occurring. Rain falling on extremely cold surfaces can produce similar effects. It is therefore important to prepare for the onset of the conditions and the likely resulting collisions. Measures for dealing with the conditions fall into three main areas: advance planning, operational arrangements and hazard mitigation.

Advance planning

Risk assessments must be undertaken by Service Providers to ensure the practices expected of operatives and other members of staff on the Network in such conditions are adequately recognised.

Operational arrangements

Specific measures that must be considered by the Service Provider include:

1. A Severe Weather Desk/Silver Command must be established in advance of the anticipated freezing rain or rain falling on extremely cold surfaces. For a particularly widespread or severe forecast it may be necessary to establish a Gold Command Contact with the Police, RCC / Traffic Officer Service, adjoining service providers and local authorities and to inform them of proposed action.

2. Prior to the arrival of the rain a pre-treatment is to be made in the same manner as would be made prior to snow falling. Where road surfaces are extremely cold, and salt may not provide for an effective treatment, alternative treatment materials must be considered. See Appendix B.4 and Treatment Matrices Section 7.

3. Constant monitoring of the situation is to be made and an additional treatment is to be carried out immediately the rain commences and continued, subject to the Service Provider's risk assessment confirming that the risk level of staff operating be tolerated, until such time that the rain has ceased or the temperature of the road has risen above freezing.

4. Freezing rain usually occurs along the line of an incoming warm front. If possible, to ensure maximum effectiveness of the salt or alternative treatment material as appropriate, the advance treatment should be made in the same direction and immediately in advance of the weather front. Use should be made of weather radar where available to help determine the time of treatment. Consideration must be given to positioning vehicles on the point of the route where the weather front will first hit in order that timely treatments can be undertaken.

5. Some treatment material will inevitably be lost during and following treatment and therefore careful consideration needs to be given to the requirement for continued successive treatments.

Hazard mitigation

Informing road users of the hazard is paramount and Service Providers must implement proactive measures for example closing the road as the rain arrives and holding the traffic (rather than diverting) until such time as it is deemed safe to proceed. Such considerations will need to be made on a case by case basis taking into account local circumstances.

Where available fixed or mobile Variable Message Signs (VMS) should be used to warn road users of the hazard. The existing established procedures for requesting VMS settings to be made must be followed well in advance. This will include advising the RCC where and when messages are required, what message is to be set and advising when the message may be cleared.

The most appropriate for use in these circumstances, defined in the "Policy and procedures for the use of variable message signs by the Regional Control Centres" are:

Nn J*- J* RISK OF ICE	This message must only be used when an incidence of ice on the carriageway, which presents a significant road safety hazard due to slippery conditions combined with lack of road surface treatment, is confirmed between two junctions upon the named road, e.g. freezing rain.
to **RISK OF ICE SLOW DOWN**	This message must only be used when a section of carriageway(s) is subject weather conditions that are known to form ice, e.g. a wet surface combined with freezing temperatures, and it has not been possible to re-treat said carriageway (post rain washing original treatment away) in time to prevent ice forming.

It should be noted that the previously recommended 'SKID RISK SLOW DOWN' message is not a weather related message and therefore should not be used to advise of freezing rain or ice.

National Incident Liaison Officer (NILO) and/or the Highways Agency Press Officer must be contacted in order that the local media can be advised as necessary.

Where available use of variable mandatory speed limits must be considered. This will require arrangements and protocols to be established with the appropriate Police Control office or RCC as part of the advance planning procedures.

Consideration should be given to the use of rolling blocks and convoy arrangements to either hold or slow traffic down both just prior and during the event. This will require arrangements and protocols to be established with the appropriate Police authorities or RCC as part of the advance planning procedures.

Low Temperature combined with Low Humidity Conditions

Such conditions may occur at any time during the winter period though are most likely to occur in December and January at about the time of the winter solstice. Although not such a problem for pre-wetted salt treatments spreading dry salt can be of limited effectiveness in preventing the formation of ice when low temperatures and low humidity conditions combine. This is because dry salt requires moisture to 'activate' the dissolution process, and the formation of brine from dry salt takes increasingly longer as temperatures fall below -5°C. The effectiveness of salt decreases as temperatures fall and effective treatments may not be guaranteed with salt towards the lower end of the temperature band. The use of alternative treatment materials must be considered when spreading at (the lower of air or road surface) temperatures below -7ºC or below -5ºC in low humidity conditions (relative humidity <80%). Under low temperature and low humidity conditions it is important to ensure the anti-icing agent is wetted so that it will adhere to the road surface and be able to enter into solution even in the event that moisture is not available from the road surface or the atmosphere.

If low humidity is considered a high risk to brine formulation, Service Providers must consider supplementary measures on previously treated routes to increase the moisture content at the road surface. Such measures may include the:

- Application of additional brine solution (max 23% salt solution) through a dedicated liquid sprayer or a brine-only treatment using a pre-wet vehicle. Arrangements with adjacent areas can be considered for those areas that do not have pre-wet vehicles.
- Provision of an additional preventative treatment earlier in the day than standard treatment times to utilise the generally higher humidity levels, higher temperatures and increased traffic flows. (Note that additional treatments should not replace standard pre-wet / dry salt treatments).
- Use of alternative anti-icing / de-icing materials such as potassium acetate or pre-wet salt with a calcium chloride brine, magnesium chloride brine or sodium chloride brine with ABP additive rather than sodium chloride brine.

Sustained low temperatures

Salt is generally effective at preventing the formation of ice during sustained low temperatures, provided it has time to form a brine, which is helped where traffic is reasonably heavy. The time taken to form a brine becomes increasingly lengthy as temperatures fall and can be a significant time for extreme cold temperatures. As a result, salt becomes less effective at preventing the formation of ice during extreme cold with there being a point when alternative treatments must be considered and be available for use. There is no definitive temperature at which salt becomes ineffective, as it is dependent upon the dissolution process and therefore local conditions, e.g. time available to form brine, available moisture and traffic levels, though the National Winter Service Research Group (NWSRG) consider alternative treatment materials may be justified when temperatures fall to minus 7°C or below.

NWSRG have developed guidance for the use of alternative treatments in extreme cold. Pertinent parts of that guide have been included within the Severe Weather Plan for ease of reference including treatment matrices for spreading materials in conjunction with rock salt (see Section 7).

Snow drifts and build-up of snow

Heavy snowfall, drifting and ploughing operations may result in a build-up of snow in the carriageway and hard shoulders. If snow depths reach 120mm or when tackling drifts, or when working on gradients, it may be preferable to plough without spreading, since the weight of the treatment load will aid vehicle traction. Snow blowers are particularly suited to the clearance of blockages and for the removal of accumulations from the hard shoulder and carriageway where snow may be safely directed onto the verge (or possibly a wide central reservation).

Ploughing or snow blowing is not practical in built up areas given the snow is ploughed or thrown to aside respectively. Repeated applications of de-icer can remove heavy accumulations, but this type of treatment is not recommended as it is likely to provide an unacceptable surface for traffic. In such situations, consideration should be given to the use of a snow blower with the snow being directed into an accompanying lorry, followed as soon as possible by salt spreading.

B.7 TREATMENT OPTIONS/TECHNIQUES

This annex provides instructions and guidance on treatment techniques and refers to precautionary treatment, treatment of settled snow/ice and treatment of footways and cycle tracks. To be most effective, precautionary treatments should be applied before ice forms or snow settles on the road.

Techniques for Precautionary Treatments

Dry salt used to prevent ice or frost formation must first form a solution (brine) to become effective, resulting in a time lag following spreading. Therefore, pre-wetted salting is the Highways Agency's preferred precautionary treatment.

A decision to treat will depend upon many factors generally if road surface temperatures are predicted to fall below plus 1°C a precautionary treatment should normally take place unless:

- no moisture is on or is expected to be on the road; or
- there is sufficient residual salt on the road to deal with the expected conditions.

Opportunities to conserve salt may be realised on marginal nights, by considering:

- the introduction of patrols to direct focused treatment or
- delaying the decision to treat until there is greater certainty of need, other potential impacts, e.g. rain, are better known, whilst ensuring sufficient time is allowed to treat prior to ice formats or snow settles.
- 'Standby in depot'.

Selective treatment of parts of a route may be considered provided the Service Provider complies with the Technical Requirements. Identification of problematic areas can be informed by route based forecasting or thermal mapping to ensure these areas are treated appropriately.

For forecasts of significant accumulations of snow it is essential that sufficient treatment is applied before the snow starts to stick to the road as the treatment will melt the initial snowfall and provide a debonding surface beneath subsequent snow making the work of snowploughs much easier.

Due consideration must be given to traffic conditions and the timing of Winter Service operations. Wherever possible without detriment to the effectiveness of treatment, precautionary treatment should be undertaken in off-peak periods when disruption to traffic and to proper distribution of the treatment agents will be minimised. If precautionary treatment in heavy traffic is unavoidable it may be necessary to seek assistance from the Police, Traffic Officer Service and RCC (including motorway matrix signals and variable message signs) or to consider treatment in two runs (to ensure proper distribution of the anti-icing/de-icing agents).

To be effective, anti-icing/de-icing agents should be spread evenly and at rates that suit the prevailing or expected conditions. Care should be taken to ensure spread widths are neither too wide nor too narrow. The treatment should be carried out using automatic machines, the controls of which should be calibrated and clearly marked for distinct rates of spread, up to a maximum of $40g/m^2$. Higher spread rates are unnecessary, wasteful and environmentally harmful and should be avoided.

Care must be taken at road works so that, in addition to areas currently being trafficked, all other areas likely to be opened to traffic are treated. Traffic management equipment, including cones and cylinders, may disrupt distribution of anti-icing/de-icing agents. Contra-flow systems should be treated in both directions.

Top up precautionary treatments

Brine is effective immediately after spreading and unlike solid de-icers can reduce the risk of ice formation without the need for trafficking. Therefore, brine may be considered for an additional top-up treatment, to help activate solid de-icers, for areas with little or no traffic such as lightly trafficked slip roads.

Although pre-wet spreaders are able to spread brine this may require modification of the current software to bypass the solid de-icer distribution on some vehicles. Service Providers should contact the spreader manufacturer for instructions on how to set up pre-wet spreaders to spread brine with solid de-icer in the hopper.

Two lane slip roads may be spread with brine asymmetrically to the right, i.e. driving in Lane 1 and spreading to Lanes 1 and 2. A one lane slip road may be spread with brine by driving in the lane to be treated. In both cases, the standard spinner settings for pre-wetted salting one lane symmetrically or two lanes asymmetrically to the right can be used. Tests have shown that it is not possible to spread brine asymmetrically to the left, i.e. to a hard shoulder from Lane 1, with the standard settings for pre-wetted salting.

If brine treatments replace, rather than supplement, pre-wetted treatments the salt concentration of the brine has a greater influence on the amount of salt on the carriageway. This is because pre-wet comprises a 70:30 ratio of dry salt: brine therefore; the dry salt component is the major contributor to the salt on the carriageway. For a brine only treatment a brine concentration of 20% means the amount of salt on the carriageway is reduced by 13%, compared to spreading a brine concentration of 23%. It is thus recommended that brine of the 23% optimum concentration is used for brine-only treatments.

The ability of the pre-wet spreaders to spread brine, without modification to the spinner, is limited by the capacity of their brine pump meaning a maximum spread rate of approximately 40g/m^2 to a single 3.6m wide lane or 20g/m^2 to two lanes of total width 7.2m. Assuming a brine concentration of 23%, this equates to a nominal dry salt spread rate of 9.2g/m^2 and 4.6g/m^2, respectively.

Treatment of Snow and Ice

The effectiveness of treatments of snow and ice on the paved areas can be significantly affected by the method of application of the treatment. The following advice covers the operational techniques for removing snow and ice from paved areas. The techniques include:

- snow ploughing
- snow blowing

In addition, snow fences can be located to prevent snow drifting on to the carriageway and snow gates utilised to close a road when it is impassable due to snow.

During snow clearance operations, any build-up of snow across rail, bridges, gateways and along fences should be promptly removed and measures taken to avoid further build up. Throughout any operation to remove snow and ice, periodic situation reports should be provided for the Service Manager and road users.

It is important to continually monitor the air temperature during clearing and, as the temperature drops, spread rates should be increased, up to 40g/m^2 if necessary. Although current vehicle mounted infrared thermometers offer reasonably high accuracy levels Road Weather Information Systems or thermometers at suitable open sites in compounds, or similar systems are generally preferred.

The density of fresh untrafficked snow is about one-tenth of that of ice and the action of traffic assists in the process of melting and dispersal. However, even light snowfalls may call for ploughing where local drifting has occurred, or where snow has not been dispersed by traffic.

This may occur where the traffic is reluctant to use lanes 2 or 3, or at night when traffic flows are light. During prolonged falls of snow, ploughing should be continuous to prevent build-up.

Particular attention must be paid to lengths of road that are known to be susceptible to 'run-off' water from verges or central reserves. Although the road itself may be dry, accumulations of snow may melt, run onto the road and then re-freeze.

Snow ploughing

The Service Provider should commence snow ploughing operations early enough to ensure snow accumulations do not exceed 10mm in any lane. If road surface temperatures are at or forecast to fall below 1°C the initial pass of the plough should be supplemented by salt spread at up to 20g/m^2 to prevent the compaction of any remaining snow and to aid dispersal by traffic and subsequent ploughing. Otherwise ploughing without continuous salting must be considered and after an area wide treatment drivers may be instructed to salt as and when required (spot salting).

The ploughs provided by the Highways Agency are designed to operate at zero height setting. The Service Provider must ensure plough heights are set in accordance with the manufacturers recommendations. Care must be taken to avoid damage to road surfaces, road studs, roadside furniture and structures. At road works, traffic management equipment must not be disrupted.

If snow depths reach 120mm or when tackling drifts, or when working on gradients, it may be preferable to plough without spreading, since the weight of the treatment load will aid vehicle traction. When conditions permit, spreading must be resumed. Use of a snow blower may also be considered for the removal of deep snow.

Ploughing or snow blowing is not practical in built up areas. Repeated applications of de-icer can remove heavy accumulations, but this type of treatment is not recommended as it is likely to provide an unacceptable surface for traffic. In such situations, consideration must be given to the use of a snow blower with the snow being directed into an accompanying lorry, followed as soon as possible by salt spreading.

The formation of hard packed snow and ice should be a rare occurrence if the performance requirements are achieved. If it does occur, provided it is no more than 20mm thick and the air temperature is above minus 5°C, removal is possible by using successive treatments of salt at rates given in the Treatment Matrix Guide.

NWSRG has developed guidance for the use of alternative treatments in extreme cold, this includes guidance on how these may be used to clear hard packed snow and ice. See NWSRG's Practical Guide for Winter Service Delivery.

Great care must be taken as the use of de-icing agents on snow or ice can produce an uneven and slippery surface. If there is any danger that the surface will become unacceptably slippery as a result of using de-icing agents, then the addition of abrasives must be considered. Application of the initial treatment technique should be resumed as soon as possible since abrasives contribute little to the removal of snow/ice and may block drains and gullies upon thawing. Abrasives should not be used on structures where there is any danger of blockage to drains. If abrasives are used the treated section must be swept and drainage gullies emptied as soon as reasonably practicable.

The technique used for multi-lane carriageways should be 'clearance by lane'.

In prolonged, heavy snowfall the priority will be to maintain lanes open in accordance with the red amber green performance requirements. In the majority of cases this will be the more heavily trafficked left hand lane (lane 1) and the first operation will be to plough snow from lane 1 to the hard shoulder, with clearance of other lanes continuing as conditions improve.

An alternative technique for a 3 lane carriageway with hard shoulders, particularly suited to echelon ploughing (2 or more vehicles moving in the same direction, one behind the other, in different lanes), is clearance in the following sequence:

- First: plough lane 2 snow to lane 1
- Second: plough lane 1 to hard shoulder
- Third: plough lane 3 snow to central reserve
- Fourth: plough hard shoulder snow to verge.

More than 2 lanes ploughed onto the central reserve could be hazardous to traffic by inviting drifting and melt water problems later. When clearing 4 or more lane carriageways consideration should be given to abandoning the outermost lane(s) rather than creating problems of excess snow on the central reserve.

Irregular windrows caused by ploughing passes, especially those that weave from one lane to another, are dangerous, as they may tempt drivers to overtake by squeezing into the partly cleared lane. Lanes must be completely cleared, and the windrows of snow remaining must form a smooth and continuous line without sudden encroachments into the cleared path. On motorways, windrows can be left on hard shoulders, but there should be intermittent clearings to provide refuge for broken down or abandoned vehicles, and these should be cleared as soon as lanes 1, 2, and 3 are cleared and should not be left indefinitely.

Under no circumstances will windrows be created across off and on slip roads where they diverge/converge with the main carriageway.

Speeds of ploughing vehicles must be regulated, particularly at features such as underbridges, where snow could be thrown over the bridge parapet, and adjacent to the central reserve, where snow could be pushed into the opposing carriageway.

The objective is to clear all lanes and hard shoulders as soon as conditions permit. Clearance work should therefore proceed continuously, since a pause during a snowfall could lead to a build-up, which would take a disproportionately long time to clear. Packed snow, glazed by the wind, can be particularly difficult to remove.

Where clearing single carriageway roads, particularly those which have more than two lanes, snow clearing operations will be carried out so as to avoid any build-up of snow in the centre of the road.

Following normal snow clearing efforts carried out during snow fall, echelon ploughing to the left whilst spreading salt is an option to clear snow from those lanes sacrificed at cessation of snowfall providing sufficient resources can be made available. This will provide, when combined with a rolling road block, a relatively rapid method of removing the stored snow. Service providers must consider the training of operatives in echelon ploughing.

A phased approach may be required for 4 or more lane carriageways. Resources may need to be diverted from other areas of the Network where clearance work is complete or considered a lower priority in order to undertake such echelon ploughing.

Assistance must be sought from Traffic Officers or the Police to provide a rolling block when clearing snow from lanes which have been abandoned during heavy snow fall.

When ploughing, motorway warning signals can be displayed, so liaison with the RCC is essential. It is not always possible to keep these signals free of snow, but every effort must be made to advise motorists of the snowploughing vehicles ahead. Suitable advance warnings must be posted to inform motorists if lanes are not available for use. Variable Message Signs or Portable Variable Message Signs should be utilised.

Special consideration needs to be given to ploughing in areas of contra-flow or other temporary traffic management where normal techniques and equipment may not be suitable.

Snow Blowing

Heavy snowfall, drifting and ploughing operations may result in a build-up of snow in the carriageway and hard shoulders. Snow blowers are particularly suited to the clearance of blockages and to the removal of accumulations from the hard shoulder and carriageway where snow may be safely directed onto the verge (or possibly a wide central reservation).

B.8 REPEAT TREATMENTS GUIDE

Condition	Key information	Predicted conditions	Treatment guidance
Rain after treatment but before freezing	The current spread rates assume that little water is likely to be present on road surfaces in winter conditions, and this is normally the case (See Note 1) Water on the surface will reduce the effectiveness of salt by: • Dilution of any brine solution formed • Causing salt wash off As a guide, greater than 2mm will result in salt wash off and require retreatment. Use rainfall radar to determine and treat only effected areas where possible	More than 1mm of rain based on weather station data or radar or forecast	Make repeat treatment after rain stops, allowing as much delay as practicable for water to be dispersed by drainage and traffic before freezing.
		Less than 1mm of rain based on weather station data or radar or forecast	Monitor and carry out repeat treatment after rain stops if required and allowing for water to disperse when practicable. Road sensors can be used after rainfall to determine whether the freezing point of water on the road surface is low enough for the forecast minimum road surface temperatures. Make repeat treatment as soon as practicable where roads are wetter than allowed for in current spread rates (see Note 1)
Rain just before freezing	See Appendix B5 of the Severe Weather Plan template for information on effectiveness of salt after rain Traffic aids the dispersal of water. If a road surface is well drained and has been trafficked for an hour or so after rainfall, relatively little water will be present at the road surface There is a lower rate of loss when salt is in solution than in solid form. Salt will enter solution rapidly when road surfaces are wet	Freezing just after rain (<1 hour)	Make repeat treatment if freezing is forecast just after rainfall and roads are wetter than allowed for in current spread rates (See Note 1)
		Freezing delay after rain (>1 hour but < 3 hours)	Delay initial treatment as long as practically possible after rainfall to enable trafficking to disperse surface water so spray is minimal. Repeat treatment should be considered in poorly drained areas, where there is run-off and where (and when) there is little trafficking (e.g. lightly trafficked areas of slip roads, lightly trafficked roads on Sunday mornings) (See Note 1)
Change in forecast to more severe weather	A repeat treatment will be required when there is a decrease in the forecast road surface temperature and/or the forecast road surface state is wetter than was assumed for the initial treatment	Change in forecast to colder road surface temperatures or wetter road surfaces	Make a top-up treatment if the spread rate for the changed forecast conditions is higher than the spread rate for the initial treatment

Condition	Key information	Predicted conditions	Treatment guidance
Road wetter than allowed for in current spread rates, heavy hoar frost, freezing fog (See Note 1)	Higher spread rates or repeat treatments are required when more water (and/or less residual salt) is likely to be present than allowed for in the current rates	Heavy rainfall before treatment Inadequate drainage or run-off Heavy hoar frost Freezing fog Lightly trafficked roads	Increase initial spread rate (e.g. to the rate for the next temperature band) or consider making initial treatment at the specified rate and repeat treatment(s) at the same rate. Conditions that are most likely to require repeat treatment(s) include: • Poorly drained surfacing or open textured surfacing after heavy rainfall • Lightly trafficked surfaces (e.g. lightly trafficked areas of slip roads, lightly trafficked roads on Sunday mornings, bank holidays etc.) • Dew point above the road surface temperature: (i) by several degrees (ii) for a long period e.g. over long winter nights from late November to mid-January (iii) when there is a light breeze that maintains moist air at the road surface
Temperatures below freezing spanning at most one peak period	The current spread rates assume a certain percentage loss of salt from road surfaces after spreading. The rates do not allow for loss over long periods.	Freezing occurring after one peak period and for duration less than 12 hours with no precipitation	Monitor conditions and only treat again before next peak traffic period if necessary. Delay initial treatment as long as possible to reduce salt loss before freezing but without compromising dissolution of salt by trafficking etc. Conditions that are most likely to require repeat treatment include when: • Road surface is wet • RST below -5ºC • Heavy hoar frost forecast • When forecast has changed following initial treatment • Reports of ice on roads or hard shoulders (from patrols/Police/TOS)

Condition	Key information	Predicted conditions	Treatment guidance
Temperatures below freezing over up to 2 peak periods	The current spread rates assume a certain percentage loss of salt from road surfaces after spreading. The rates do not allow for loss over long periods. In general it should be assumed that a repeat treatment is required if an initial treatment is made just before (or during) one peak traffic period and temperatures will still be below freezing from just before to after the next peak period	Freezing from one peak period to just before or after another peak period, with no precipitation in the intervening period	Make repeat treatment before second peak traffic period and within 12 hours of the initial treatment. Consider using a spread rate for the initial treatment for the road conditions forecast up to the time the repeat treatment has been completed. Where possible, time repeat treatments to avoid spreading when the road surface temperature is less than -5˚C It may be possible to either carry out the repeat treatment at reduced rate, or omit the repeat treatment when • A number of treatments have been made over two or more days in dry weather and measured residual salt levels are high. • The humidity is such that the road surface is drying, e.g. changing from wet to damp or dry (but see below) and no increase in humidity or precipitation is forecast for the period of the treatments effectiveness • The minimum road surface temperature in the morning is at least one temperature band less than temperature band for the treatment made in the evening.
Sustained freezing (i.e. temperatures below freezing spanning at least 3 peak periods	Repeat treatments may be required when below freezing conditions are sustained over long periods. Road surfaces can be essentially dry in periods of sustained freezing because of a lack of precipitation and low humidity conditions. In such conditions, repeat treatments may not be required when residual salt levels have built up and/or the road is dry such that the risk of ice formation endangering road users is low. Treatments should be delayed if the salt that is spread will not enter solution. Accumulations of undissolved salt in sustained freezing can significantly increase chloride levels in water courses when they are dissolved during subsequent rainfall.	Freezing spanning at least 3 peak periods, with no precipitation in the intervening period.	Normally make treatments between each peak period so that the time between treatments is no more than 12 hours. Where possible, time repeat treatments to avoid spreading when the road surface temperature is less than -5˚C Monitor the dryness/wetness of the road surface and consider reduced rate treatments or treatments more than every 12 hours when residual salt levels are high and/or the road surface is essentially dry.

Note 1. To calculate spread rates, it was assumed a wet road is one where minimal spray is evident and there is no water flowing across the surface. The maximum water film thickness for a well-trafficked road is 0.05mm and for a lightly trafficked road 0.1mm. Where road sensors indicate a wet road this indicates that more water is present than the maximum water film thickness allowed for in current spread rates and the treatment effectiveness will be less than stated in the treatment matrix guide.

Appendix 11

Road Restraint Systems Maintenance Requirement

Version 1.0

Appendix 11

Road Restraint Systems

Lane Restrictions at Barrier Repairs

General

A risk management approach has been developed for the management of road restraint system (RRS) repairs, in order that an appropriate balance is struck between the risks posed by the damaged RRS to road users and the risks posed to road workers and road users whilst repairs are made. It also takes account of disruption, potential loss of capacity and delay that may be incurred due to lane restrictions, particularly during peak hours.

Risks

Road restraint systems are required to either mitigate the risk that a hazard may pose to the travelling public, third parties or to protect an asset from being damaged. RRS in the central reserve protect the travelling public from hazards as well as from opposing traffic, whereas verge RRS normally only protect traffic from hazards (unless near a bridge approach which protects a railway/road).

If a central reserve RRS is damaged, but is still operative, it will retain some of its protective ability, and it may be appropriate to leave it until its repair or replacement can be carried out at a time that will cause minimal disruption or delay to traffic, and minimal risk to road workers, i.e. off peak, or combine the repairs with other planned works.

A risk assessment approach to identify an appropriate repair time will be used and statistics support this. Over a 20m length of RRS, accident data suggests, the probability of an accident in the central reserve that causes injury is roughly 1 in 2000 per day. The probability of a damage only accident is roughly 1 in 300 per day. Depending on the nature of the damage to the central reserve RRS the risks of not repairing the barrier for 1 to 3 days is quite low (i.e. after 3 days the probability of an accident causing injury at the same 20m section of barrier is roughly 1 in 500).

Similarly, probability of accidents are dependent upon the length of the RRS damaged, with the shorter the length affected the lower the probability. Data gathered from Area 3 has shown that the lengths of accident damaged sections of RRS is typically short, falling into the following length bands:

64% <10m

18% 10-20m and

18% >20m

Requirements

The Provider must ensure that works sites are as safe as practicable for all staff, road users and others, both before works can start, during works and when activities are suspended for any reason. They must also ensure that any disruptions are minimised, which may create new delays and/or dangers to traffic flow or other parties, even where these disruptions may occur at some distance from an incident site.

Whilst damaged sections of RRS must be corrected or made safe as soon as possible, rigidly trying to carry out the work immediately may not give the best balance of risk to road users or road workers. The time period in which the barrier is repaired or temporary mitigation measures used must be based on a risk assessment of the site.

The risk based decision process below is intended to provide a recommended basis for making a judgement about the balance of risks at individual road works sites, involving associated traffic management, when repairing damaged safety RRS. The risk based decision process must be used in order to ensure a wide and balanced assessment of the potential risks. The aim is to ensure that the Employer's roads are kept as safe and congestion free as possible for users and risks to the workforce and third parties are minimised.

Risk Assessment for Lane Restrictions at Barrier Repairs

Risk is a combination of the probability of an accident occurring and the severity of that accident should it occur. The Risk Assessment Matrix below is used to record the factors that can affect the risk at a site and assess the associated risk levels and repair priorities following vehicle impact damage. The scores from the table for the risk factors for a particular vehicle impact location should be added to give an indication of the risk as high, medium or low.

Providers must use the Risk Assessment Matrix (Table 11.1) and supplementary guidance below for the assessment and prioritisation of repairs to barriers following RRS strikes.

Table 11.1 RRS Repair Risk Assessment Matrix

Date, location, nature and scale of damage*.	**Parts required to repair damage, i.e. number of rails and posts**	**Date/time parts can be made available**
		Date/time of permanent repair
Description of hazards and 3rd parties protected by the barrier		

	Risk Factor	**Risk Factor Scores**	**Applicable factors****	**Allocated score**
	Probability Factors			
1	High traffic flow: >30k/carriageway/day	3		
2	- - - : 20-30k/carriageway/day	2		
3	- - - : <20k/carriageway/day	1		
4	Length of barrier affected >80m***	5		
5	Length of barrier affected 50-80m***	3		
6	Length of barrier affected <50m***	2		
7	Accident history at site/location - High	5		
8	Accident history at site/location - Medium	3		
9	Accident history at site/location - Low	1		
10	Location near a major junction or tight curve	3		
	Probability Score			

	Severity Factors			
11	Feature behind barrier would be vulnerable (e.g. weak structure) and if struck could cause a secondary incident	2		
12	System used to protect 3rd parties, i.e. (central reserve barrier, bridge approach over road/rail, embankment near school etc)	5		
13	Barrier flattened: gap >20m	5		
14	- - : gap 5-20m	3		
15	- - : gap <5m	2		
16	HGV Flow: High (>15%)****	3		
17	- - : Average (12-15)****	2		
18	- - : Low (<12%)****	1		
19	Traffic speeds: Cars – Ave ≥120kph (75mph)	3		
20	- - : Cars – Ave 80-120kph (50-75mph)	2		
21	- - : Cars – Ave <80kph (50mph)	1		
	Severity Score			
	Total Risk Score (Probability + Severity scores)			
	Risk Classification*** (high ≥24, medium 13-23, low <13)			

* Take photos at the location if possible to record damage and record features at the location (and attach to the form) these may be useful to help prioritisation decisions.

** Tick those that apply.

*** This is the total length of RRS affected by vehicle impact damage and rendered sub-standard, rather than just the length of the visible damage. For untensioned barrier, the total length affected is the minimum before and after lengths of barrier specified in Table 11.2 plus the length of visible damage. For other types of barrier, such as tensioned barrier, it may be necessary to

consult manufacturer’s recommendations to establish the affected length; this is likely to be the length of the tensioned sections.

**** Note: quite often freight/HGV flow is highest off-peak and therefore this should be taken into consideration.

***** High if aggregate score ≥24, medium if aggregate score between 13 and 23, low if aggregate score <13.

Table 11.2 Minimum lengths of RRS [from TD 19 DMRB 2.2.8]

Safety Barrier Containment Level	MINIMUM "full height" lengths of safety barrier	
	In advance of hazard	Beyond hazard
Normal (N2 or N2)	30m	7.5m
Higher (H1 or H2)	30m	10.5m
Very High (H4a)	45m	18m

Definitions of Risk Levels

High Risk Sites: Where the aggregate score for an incident is ≥ 24 points then the location is classed as high risk (high consequence and probability) and some immediate mitigation measure should be considered, ideally repair to the barrier within 24hrs. It is important to ensure that both the resource and barrier stock is available to ensure this can happen. If this is not possible then the most appropriate mitigation measure must be taken, this may be in the form of lane closure (or hard shoulder closure) and temporary speed limit. It should be noted that a lane closure, whilst it may provide some mitigation due to the additional distances to be travelled by an errant vehicle, is not a substantive protection and may be little different from close coning of a site. At peak times a lane closure can cause associated congestion and accidents and public dissatisfaction and ideally should not be used if no work is to be carried out. Another solution if repair cannot take place promptly is to install a temporary barrier; this can offer an overall lower risk solution. If a temporary barrier is required, it may be preferable to locate it adjacent to the damaged section to allow full lane usage and then relocate it when works need to be carried out.

The solution should ensure that the resultant risk at the site is as low as is reasonably practicable to the road users, any maintenance operatives and any 3rd parties that may be affected. The probability of an accident increases the longer the site is left but this increase in risk needs to be balanced against immediate repair during peak times and road worker safety if carrying out the repairs at night / in poor weather when maintenance operatives are most vulnerable.

The solution will depend on the length of time needed to repair/replace the affected system.

Medium Risk Sites: Where the aggregate score for an incident is between 23-13 inclusive, the risk is medium and the probability of a secondary incident

is much reduced. The aim should still be to repair the RRS as quickly as possible but this may be in excess of 24hrs. If immediate repair cannot be carried out, appropriate mitigation until this can occur may include; fully cone the gap, advance warning and/or advisory speed limit signs when left to await repair works (this will reduce the severity of an incident). A full lane closure in this situation could increase the overall risk by increasing the risk of associated accidents due to increased congestion.

Low Risk Sites: Where the aggregate score for an incident is <13 then the site is classed as low risk (the probability and severity are both low). Examples are, the central reserve barrier has minor damage over a small section or a short section of verge barrier is damaged. Immediate repair may offer little benefit and mitigation may include coning the gap only or may include no action until traffic is low.

Supplementary Guidance on Responding to Total Risk Scores

Table 11.3 Suitable Responses to Risk Assessment Matrix Scores

<table>
<tr><th rowspan="2">Phase</th><th rowspan="2">Potential Action</th><th colspan="3">Suitability of Potential Actions to Total Risk Scores</th></tr>
<tr><th><13
(Low Risk)</th><th>13-24
(Medium Risk)</th><th>>24
(High Risk)</th></tr>
<tr><td rowspan="10">Initial Response</td><td>Immediate Permanent Repair</td><td colspan="2" rowspan="2">Preferred[1] if TM has been set out to deal with the incident provided repair to barriers with higher risk scores elsewhere are not jeopardised, parts are available and significant congestion is not caused.</td><td>Required[1] if TM has been set out to deal with the incident[2] and parts are available.</td></tr>
<tr><td>Acceptable if TM has to be set out specifically, provided it is not at times of peak flow.</td></tr>
<tr><td>Leave lane/hard shoulder closures and/or speed restrictions in place until repairs can be made</td><td>Not acceptable</td><td>Acceptable, provided the repair is given priority over other medium risk repairs and a critical lane[3] is not closed.</td><td>Acceptable, only if a critical lane[3] is not closed.</td></tr>
<tr><td>Fully/close cone the gap</td><td>Not acceptable because of the risks from cones being scattered compared to risks of the damaged barrier</td><td colspan="2">Acceptable, provided they are set out before the site of the incident is re-opened[4] and the repair will be made within 7 days[5].</td></tr>
<tr><td>Install Temporary barrier[6]</td><td>Not required</td><td colspan="2">Acceptable[7] if repair can't be made within 24 hours</td></tr>
<tr><td>Advance warning signs</td><td colspan="3">Permissible on verge</td></tr>
<tr><td>No immediate repair or mitigation</td><td>Permissible</td><td colspan="2">Not acceptable if the damage will not be repaired within 24 hours</td></tr>
<tr><td>Marker cone the gap</td><td colspan="3">Permissible only as means of identifying the location of damage to maintenance crews. To be placed in the hard shoulder, unless placed in the central reserve before the incident is cleared.</td></tr>
<tr><td rowspan="3">Completion of Repairs</td><td>Permanent repair within 24 hours</td><td>Acceptable if it can be done outside of peak flow provided repairs to barriers with higher risk scores elsewhere are not jeopardised</td><td>Preferred if it can be done outside of peak flow provided repairs to barriers with higher risk scores elsewhere are not jeopardised</td><td>Required if it can be done outside of peak flow</td></tr>
<tr><td>Permanent repair within 7 days</td><td>Preferred if resources and materials are available, provided repairs to barriers with higher risk scores elsewhere are not jeopardised</td><td>Required if resources and materials are available, provided repairs to barriers with higher risk scores elsewhere are not jeopardised</td><td>Permissible only on grounds of resource and material constraints.</td></tr>
<tr><td>Permanent repair after 7 days</td><td colspan="3">Permissible only on grounds of resource and material constraints, provided:
1 risk assessment and mitigation measures have been reviewed and updated as necessary, and
2 repairs to barriers with lower risk scores elsewhere are not given higher priority</td></tr>
</table>

[1] Lane closures and/or speed restrictions must be used as necessary to ensure road worker safety.

[2] Avoids risks of setting out TM again later.

[3] A critical lane is a lane which needs to remain open to satisfy predicted traffic demand, and, if closed, would lead to over-saturation of the remaining carriageway capacity.

[4] To save road workers having to cross live traffic lanes, but do not delay the incident clearance solely to place marker cones.

[5] Due to the increasing risk of cones being scattered.
[6] May be implemented as an initial response or later in the repair.
[7] Use temporary barrier decision tool to help make the decision.

The potential actions listed in the second column of Table 11.3 should be considered in descending order down the table. The meanings of the terms used to describe suitability are summarised in Table 11.4.

Table 11.4 Terms describing suitability of responses to Risk Assessment Matrix Scores

Priority for Action	Meaning
Required	Must be done if resources and materials are available, unless there are extenuating circumstances
Preferred	Should be done unless there are good grounds
Acceptable	Can be done if required or preferred approaches have been ruled out
Permissible	A low priority and should not be chosen instead of required, preferred or acceptable approaches.
Not acceptable	Must not be done unless there are extenuating circumstances

Table 11.5 should be used to record the prioritisation given to the damaged barrier whilst waiting for permanent repair.

Table 11.5 Barrier Repair Prioritisation

Timescale from occurrence or detection of damage	Priority position relative to other damaged barriers (x^{th} out of y)	Number of outstanding damage barriers at time		
		High risk	Medium risk	Low risk
At time of occurrence or detection				
After 24 hours				
After 2 days				
After 3 days				
After 4 days				
After 5 days				

After 6 days				
After 7 days				
Beyond 7 days				

Appendix 15

Sweeping and Cleaning Maintenance Requirement

Version 1.0

Appendix 15

Sweeping and Cleaning

The Secretary of State has responsibility for fulfilling the requirements on the motorway network and local authorities typically have responsibility for sweeping and cleaning of APTR. Section 86(11) of the Environmental Protection Act (1990) allows the Secretary of State to transfer responsibilities from the local authority to the highway or road authority. This appendix details those sections of road where the Secretary of State has exercised this power.

Tables 15.1 and 15.2 below detail those sections of APTR for which the Secretary of State retains the responsibility for sweeping and cleaning.

Table 15.1 All-Purpose Trunk Roads with Retained Litter Clearing Duties

Road No.	Description
A2	From its junction with the M2 Motorway (Junction 1) to its junction with the M25 Motorway (Junction 2).
A27	From the southern end of the A3(M) to its junction with the M27 Motorway (Junction 13).
A56	From its junction with the M66 Motorway to its junction with the M65 Motorway (Junction 8).
A5103	From its junction with the M56 Motorway (Junction 3) to its junction with the M63 Motorway (Junction 9).
A414	From its junction with the A405 to its junction with the M1 Motorway (Junction 7)

Table 15.2 All-Purpose Trunk Roads with Retained Litter Clearing Duties contracted to DBFO concessionaires

Road No.	Description
A1	From a point 350 metres south of its junction with the Great North Road at Alconbury to a point 280 metres north of the Fletton Parkway Interchange.
A1	From a point 520 metres south of the Old Great North Road at Micklefield to a point 1 kilometre north of the A64(T) Leeds Road.
A1	From its junction with the A1(M) Junction 1 to the boundary between the Borough of Hertsmere and the London Borough of Barnet.
A2	From its junction with the M25 Motorway at junction 2 to the boundary between the Borough of Dartford and the London Borough of Bexley
A3	From its junction with the B2039 to the boundary between the Borough of Elmbridge and the Royal Borough of Kingston upon Thames.
A13	From its junction with the A1089 trunk road to the boundary between the Borough of Thurrock and the London Borough of Havering.
A14	From a point 420 metres south east of its junction with Rusts Lane to its junction with the A1 trunk road.
A19	From its junction with the A168 road at Thirsk to the roundabout at the junction with the A185 county road immediately south of the southern entrance to the Tyne Tunnel.

Road No.	Description
A20	From its junction with the M25 Motorway at junction 3 to the boundary between the Sevenoaks District Council and the London Borough of Bromley.
A23	From its junction with the M23 at junction 7 to the boundary between the Borough of Reigate and Banstead and the London Borough of Croydon
A30	From its junction with the A308 to the boundary between the Borough of Spelthorne and the London Borough of Hounslow.
A30	From its junction with the M5 Motorway (Junction 29) to its junction with the A35 trunk road at Honiton.
A35	From its junction with the A30 trunk road at Honiton to the western leg of the roundabout at the junction of A35 and A31 trunk roads north east of Bere Regis.
A40	From its junction with the M40 Motorway at junction 1 to the boundary between South Buckinghamshire District Council and the London Borough of Hillingdon.
A50	From the boundary between the City of Stoke on Trent and the Borough of Stafford at the junction with the A521 county road to the junction with the A516 trunk road.
A66	From its junction with the A19 trunk road to a point 265 metres east of the overbridge to Teeside Retail Park in Stockton on Tees Borough Council.
A69	From its junction with the M6 Motorway (Junction 43) to its junction with the A1 trunk road (West Road Interchange).
A168	From a point 350 metres east of the county road overbridge located 650 metres east of the A1(M) bridge over the

Road No.	Description
	eastbound carriageway of the A168 trunk road at Dishforth to its junction with A19 trunk road at Thirsk.
A174	From its junction with the A19 trunk road at Parkway Interchange to the junction with the A1053 trunk road.
A249	From its junction with the M2 Motorway at junction 5 to its junction with the A250 (Sheerness)
A282	From its junction with the M25 Motorway (Junction 30) to its junction with the M25 Motorway (Junction 2).
A316	From its junction with the M3 Motorway at junction 1 to the boundary between the Borough of Spelthorne and the London Borough of Hounslow.
A405	From its junction with the M1 Motorway at junction 6 to its junction with the M25 Motorway at junction 21A.
A417	From its junction with the A419 trunk road to the grade separated junction at Ordnance Survey Grid Reference 388500E, 217600N near M5 (Junction 11a).
A419	From its junction with the M4 Motorway (Junction 15) to its junction with the A417 trunk road.
A1023	From its junction with the M25 Motorway at junction 28 to its junction with Brook Street Roundabout.
A1053	From its junction with the A174 trunk road to its junction with the A1085 County Road at Grangetown.
A1089	From its junction with the A13 trunk road to its boundary with the A126 at Tilbury Docks.
A3113	From its junction with the M25 Motorway at junction 14 to its junction with the A3044.

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