

# Highways England Winter & Severe Weather

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- **Opportunities for Closer Working with Local Authorities**

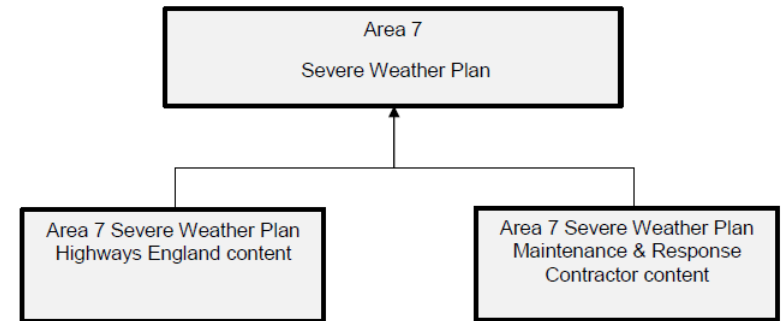
# Approach – legislation & Policy

- Highways Act 1980 Section 41 (1A) duty to ensure, so far as reasonably practicable, that safe passage along a highway is not endangered by ice or snow
- Highways England policy expands upon this to include alert procedures and actions to minimise risk posed by
  - Fog
  - High temperatures
  - Heavy rain
  - High winds



# Severe Weather Plan

- Describes policy, procedures & operational arrangements
- Specific purposes
  - Contract Document
  - Quality Plan
  - Contingency Plan
  - Operational Manual
  - Reference Document
- Set to a national template
- Reviewed & improved annually
- Developed collaboratively
  - Asset Support
  - Asset Delivery



# Severe Weather Plan Cont'd

## 1. Reporting

Central reporting via Severe Weather Information Service (SWIS) – LIVE

- Treatment actions
- Salt capability
- Fuel resilience
- Vehicles (incl. location)

## 2. Resources

## 3. Winter service route planning

## 4. Exercises and briefings

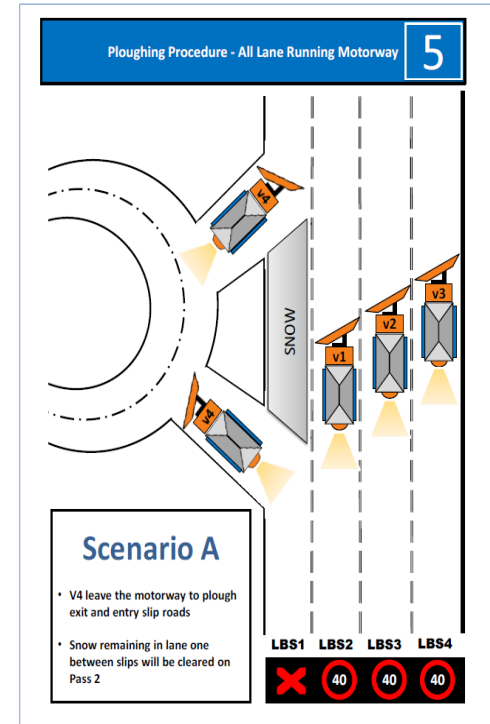
## 5. Performance requirements



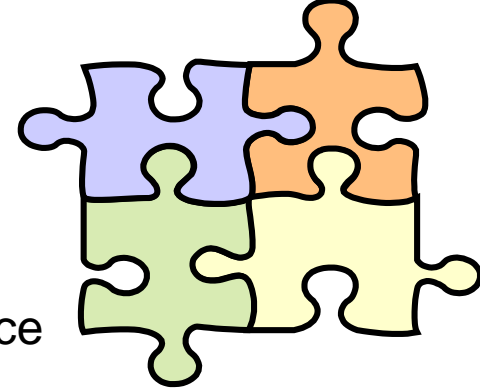
# Severe Weather Plan Cont'd

## Vulnerable Locations

- Detailed lists of locations vulnerable to severe weather including
  - Fog
  - High temperatures
  - Heavy rain
  - High winds
  - Snow & Ice
- Collaboration with Traffic Officer Service/Vehicle Recovery and winter fleet
  - Operations Traction & Side-line



# Plan, Prepare, Deliver, Review



## Pre Winter Period

- Severe Weather Plan template incorporating best practice nationally populated and in place 1<sup>st</sup> October
- Pre season dry runs – to test route changes and familiarise drivers

## During Winter Period

- Severe Weather Desk Exercise
- Stakeholder briefing
- Continual improvement through debriefs and lessons learnt

## Post Winter Period

- End of season review, recording key issues, and lessons learnt
- Provide feed back through end of season questionnaires, and operational assessment reports
- Feeding in to development of new Severe Weather Plan

# Performance Requirements Snow Response

## Snow Clearance Plan

Red, Amber and Green route status

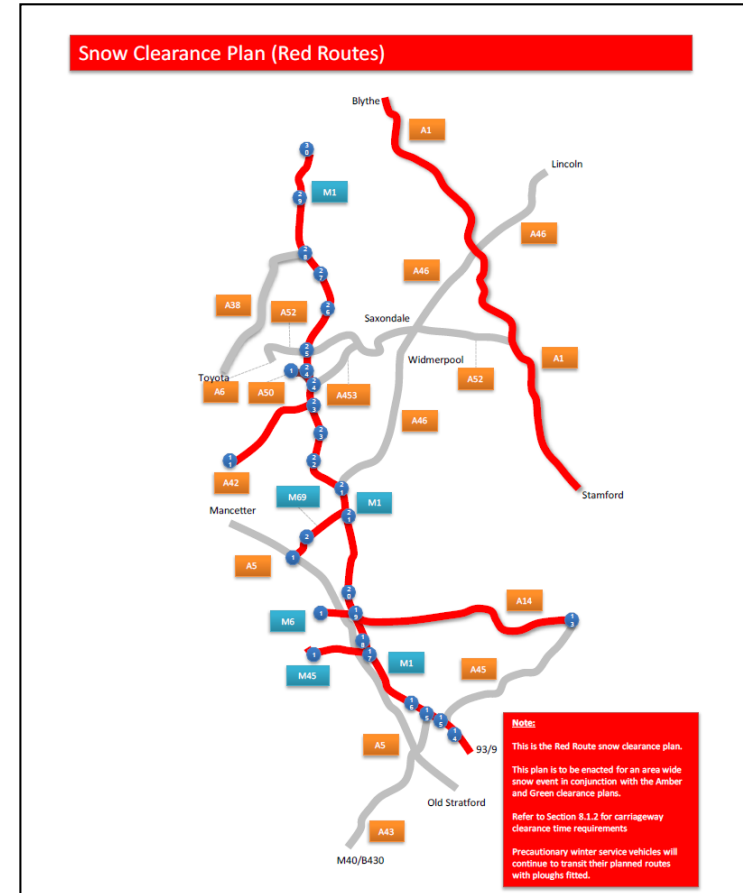
Defines lane availability during snow

Reduced lanes kept open during snow

Defines resource deployment

Full clearance following cessation

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





# Service Delivery Times



## Asset Delivery Areas / Maintenance & Response:

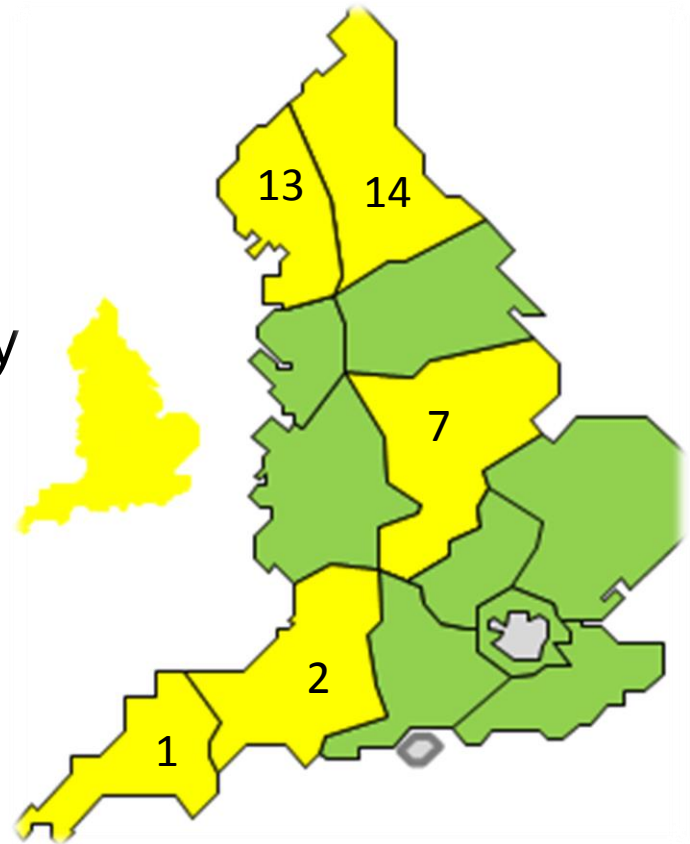
- Mobilisation = 1hr
- Treatment time = 2hrs

## Asset Support - Maintenance & Operational Requirements (AMOR)

- Mobilisation = 1hr
- Treatment & turnaround time = 3 hrs

# Organisation

- 13 Areas
- Operated as Asset Support Contracts (ASC) or Asset Delivery Areas
- Areas 1, 2, 7, 13 & 14 Asset Delivery Areas
- Asset Delivery - directly manage assets and network operations rather than contracting the responsibility to a ASC



# East Midlands Asset Delivery (Area 7)

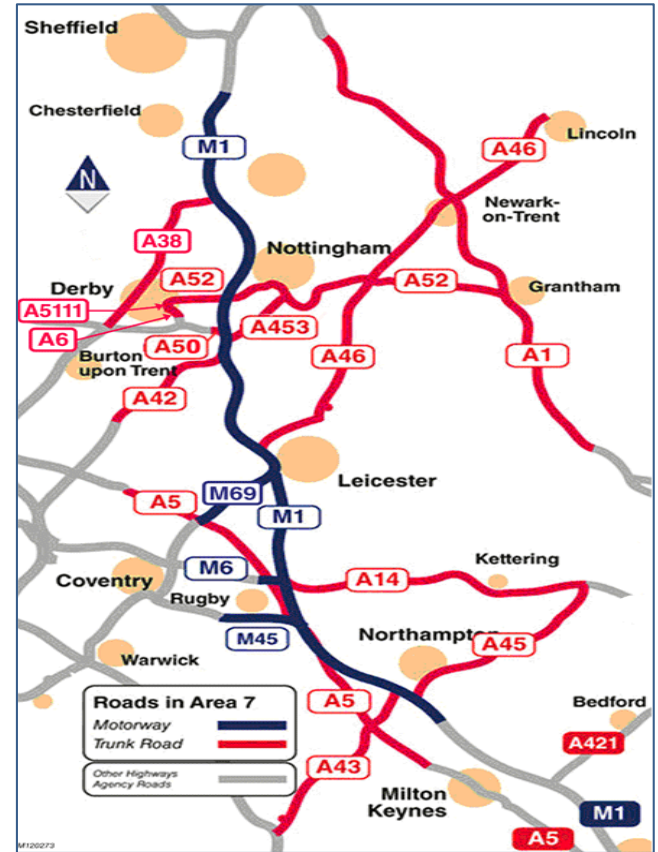
Serves major cities: Nottingham, Leicester, Northampton and Derby

- 940 miles of motorway & trunk road
- 1,413 structures
- 13,702 street lighting columns
- 4,299 illuminated signs
- 10 Depots
- Winter Fleet 47 spreaders, 2 snow blowers.
- 32 winter precautionary routes

Head Office: Stirling House, Nottingham

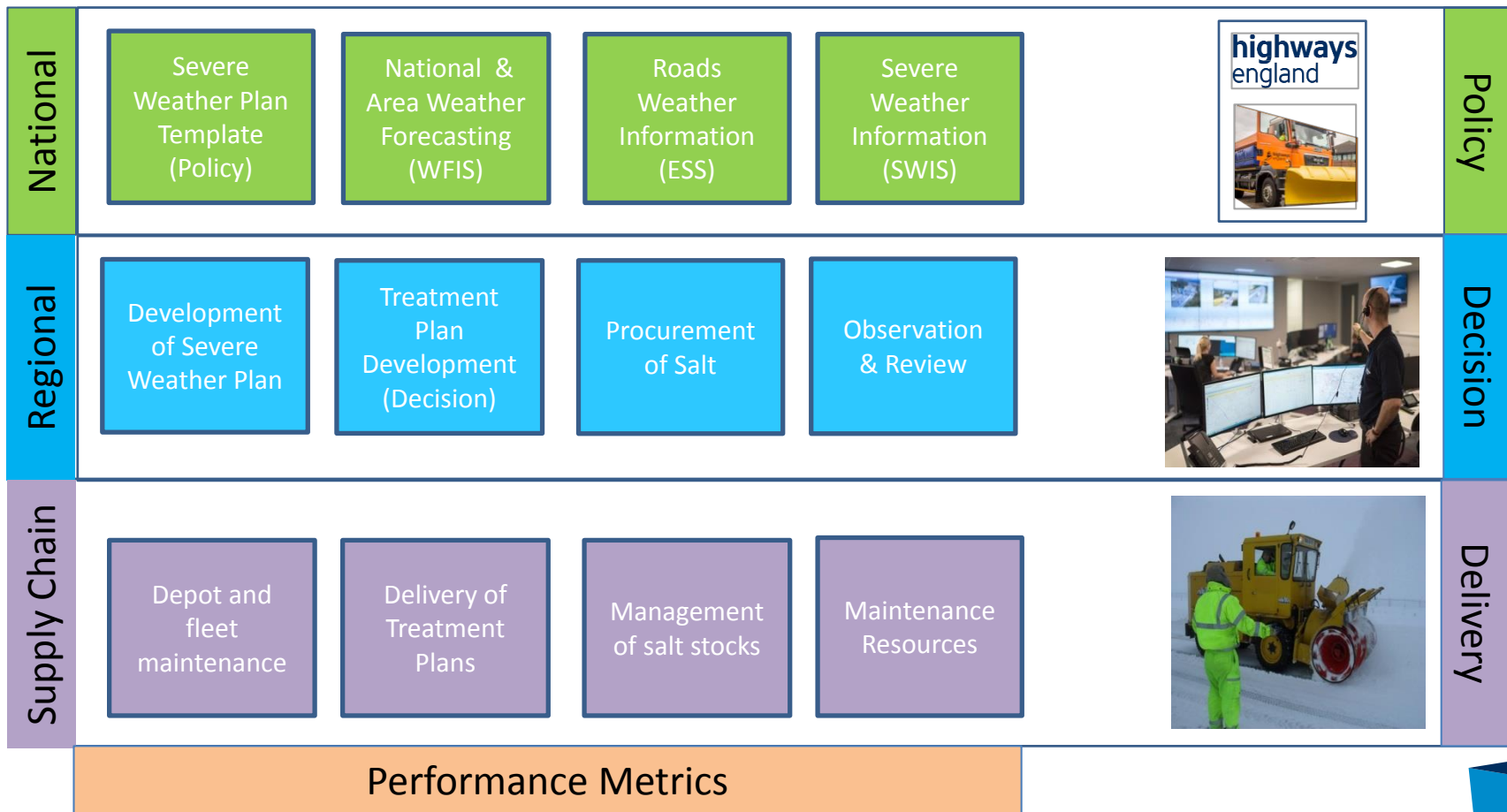
Routine and capital maintenance had previously been carried out through a Managing Agent Contract.

Asset Delivery commenced on 1<sup>st</sup> July 2016. There were 150 staff TUPE transferred from the previous service provider





# Winter & Severe Weather Service Asset Delivery



COLLABORATION

# Severe Weather Desk

## Purpose

- Operated by each Area (specific arrangements)
- Requirement of the Severe Weather Plan
- Enhanced management process to provide support
- Provides additional resources
- Tactical management
- Preplanning
- Communication hub

Established prior to the forecast commencement of severe weather, that could cause network disruption, or as soon as possible in the event of un-forecast severe weather

## 3 escalation stages being

- Level 1 - Pre-activation – planning / alert
- Level 2 - Lower impact event confined area.
- Level 3 - High impact event effecting majority of Area

May be activated at any level as conditions dictate

# Technology and Organisation

# Winter Fleet

- 437 vehicles (47 in East Midlands)
- Dry/Pre-wet/Liquid/Combi
- 4x4 and 6x4
- 2 suppliers
- 2 chassis types
- 2 body designs
- Manual treatment operations



# Other Plant & Equipment

- 23 Snow Blowers - 2 in East Midlands
- Salt Saturators - 8 in East Midlands
- Loading Shovels (Service Provider)





# Salt Stocks

- 280,000t + operational salt stocks at start of winter (34,000t in East Midlands – 22days capability)
- Operational stock managed through SWIS
- Storage arrangements for local authority salt now included as a protocol (National Salt Reserve) in Annex C of the Highways England Framework Agreement
- 380,000t strategic salt stocks (National Reserve)
- 280,000 tonnes stored for local authority use – 6 ports
- Regular inspections
- 100,000 tonnes stored for Highways England use
- 3 HE barns for HE reserve stocks inc Misterton:
- M1 Leics completed 2015, capacity 55000 tonnes



**highways england**

**SALT STOCKPILE INSPECTION REPORT (SSIR)**

**Avonmouth Docks**

Date: 12.07.2016  
 Time: 11:15am  
 Inspectors Name: Helen Jordan/Highways England

Stockpile ID / Location within site: Avonmouth Stockpile, off Zinc Road, BS11 9BY

**1. Site security**  
 If applicable, please provide details around the condition of security fencing, gates and locks.  
 Provide details of any signs of tampering of the stockpile, sheeting, fencing etc. Provide details of any other noteworthy security issues or comments.

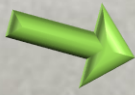
1. Has access been gained to the salt site: Yes  
 2. How was access gained to the site: Binstol Port Police control gate  
 3. Who was your contact for access: 2. Nick Venn (Person in charge of site induction)  
 4. If access has not been gained, why not and to whom you have escalated this to why: Open access within port perimeters

# Environmental Sensor Stations (ESS)

## 256 Environmental Sensor (Weather) Stations (26 in East Midlands)

- Real-time data feed through the NRTS network
- Feeds into the Severe Weather Information Service
- Feeds into the weather forecasting service
- 50+ parameters including RST, Dew, Surface State
- Some sites shared with Local Authorities

256 ESS



**Forecasters**

Met Office  
Met Desk  
Meteo Group



# Weather Forecasting Arrangements

## National Forecasting Service

- Embedded Forecasters in Quinton
- National Forecast
- Severe Weather Alerts
- Weather Advisories

## Area Forecasting Service

- Each Area procures their own forecasting service
- 13 Area contracts
- 10 DBFO contracts

## Partnerships:



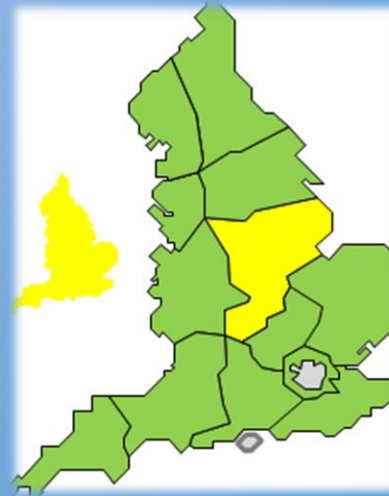
## New Weather Forecasting Contract

- Integration of forecasting contracts
  - National Forecast Service
  - AD Areas 1, 2, 7, 13 & 14
  - Opportunity to include ASCs, MACs & DBFOs

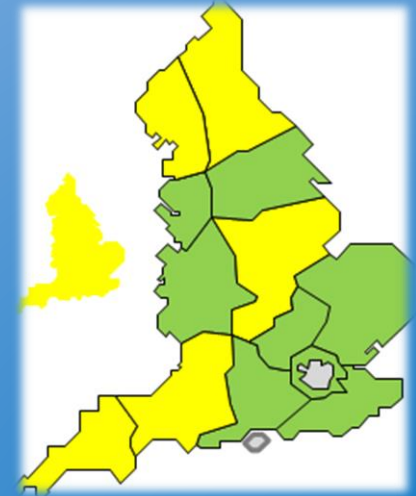
## Benefits

- Driving forward innovation
- Consistent message across the SRN

July 2016

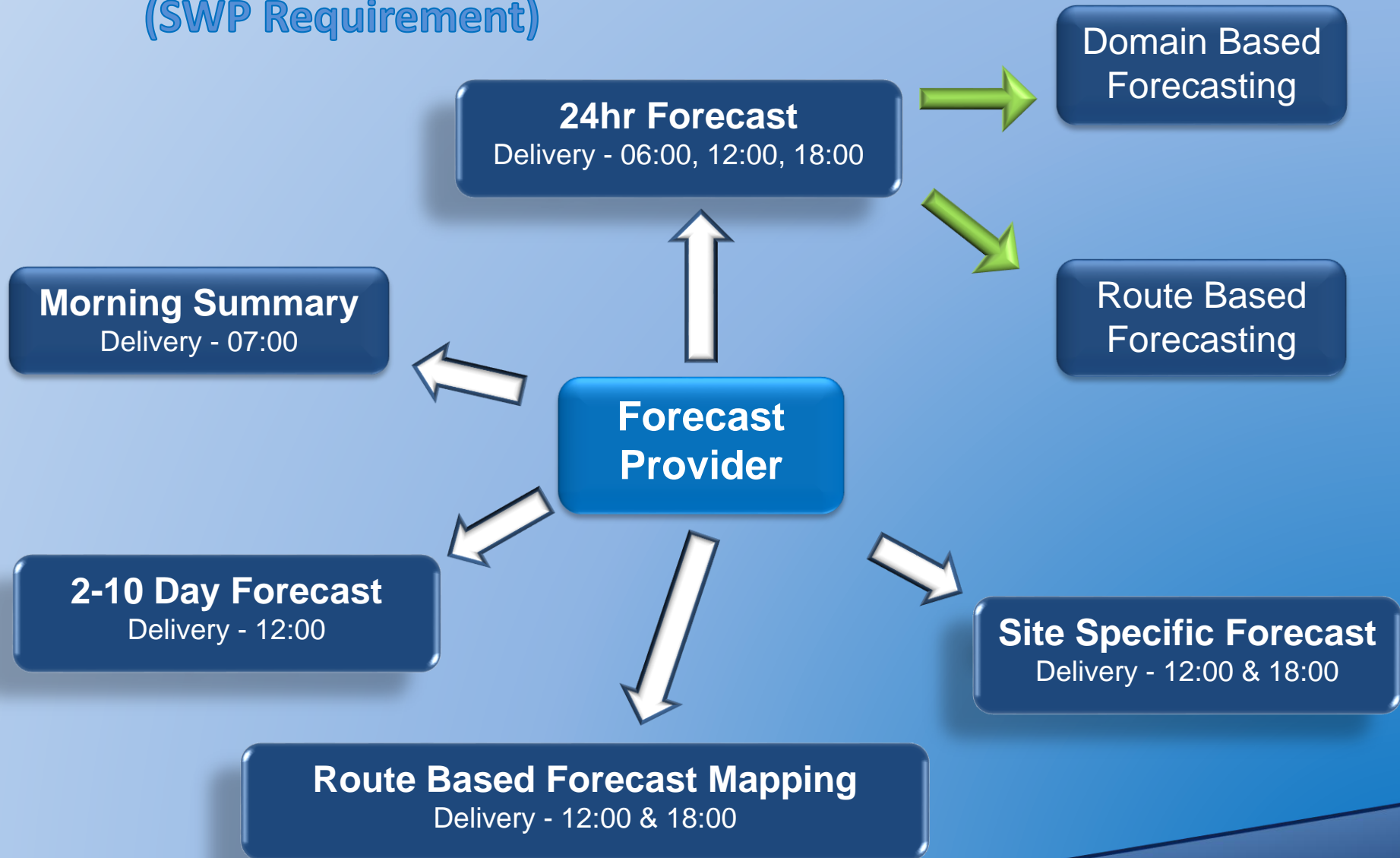


July 2017



# Area Forecasting Service

(SWP Requirement)



# Severe Weather Information Service (SWIS)

The Severe Weather Information Service (SWIS) system combines information formerly associated

- HAWCS central weather information system
- WRF1 reporting and compliance
- Vehicle treatment management information

Together these form a single source of truth for all winter service information, decision reporting, journey/treatment information and compliance

# Severe Weather Information Service (SWIS)

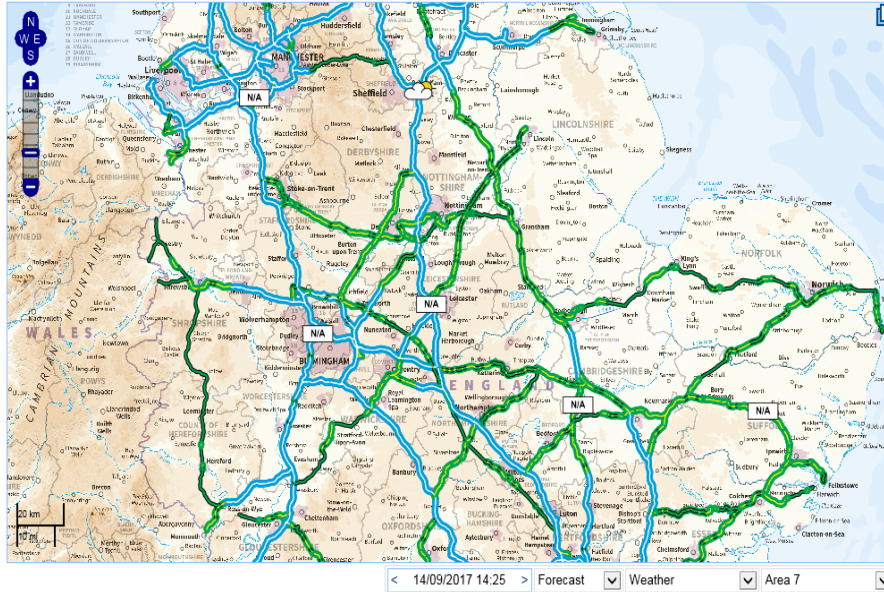


SWIS >> Weather Summary

Contact Us | Help | Print | Logout (simon.phillips@swis.highwaysengland.co.uk)

- Weather Summary
- Environmental Sensor Stations
- Forecast Images
- Area Forecast Receipt Performance
- Alarms/Alerts
- Winter Service
- Vehicles
- Salt
- Historic Data Download
- My Profile
- Distribution List Management

Area Forecast - Area 7 - 14/09/2017 14:25 (Current)



Background mapping contains Ordnance Survey data © Crown copyright and database right 2014

Weather symbols supplied by the Met Office. Crown Copyright © 2011

### Severe Weather Warnings

Met Office Severe Weather Warnings affecting Area 7:

- No Weather Warnings of rain
- No Weather Warnings of wind
- No Weather Warnings of snow
- No Weather Warnings of ice
- No Weather Warnings of fog

### Environment Agency Flood Warnings

Users can access current information via the Environment Agency's website at <https://flood-warning-information.service.gov.uk/> or via the Floodline service on 0845 988 1188.

### Active SWIS Alarms

No Active Alarms

Morning Summary	24hr	2 to 10 Day	Site Specific Forecasts	Severe Weather Warnings	Environment Agency Flood Warnings
Minimum RST - Previous Night			Outstation Performance		
Location			Road Temp		Time
Previous 24hr Summary					

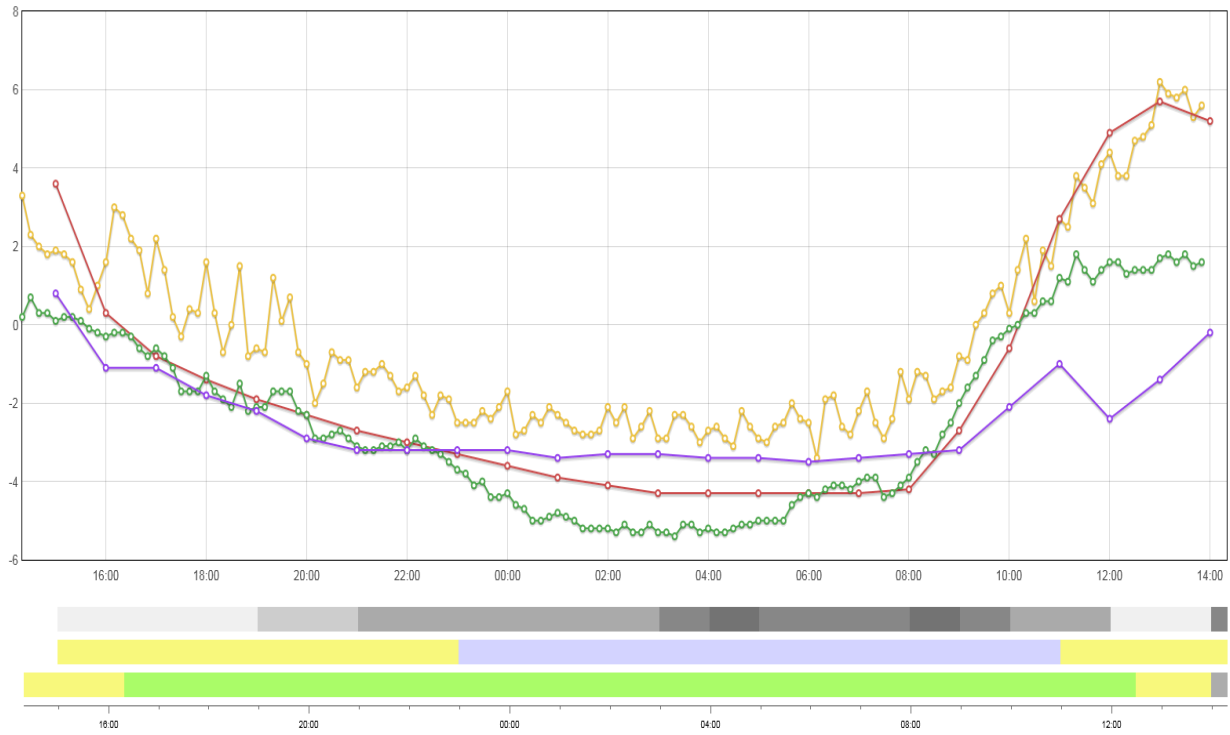
100%



A43 - Blisworth Bypass - 30/11/2016 14:21

Period start time: 29/11/2016 14:19 | Help

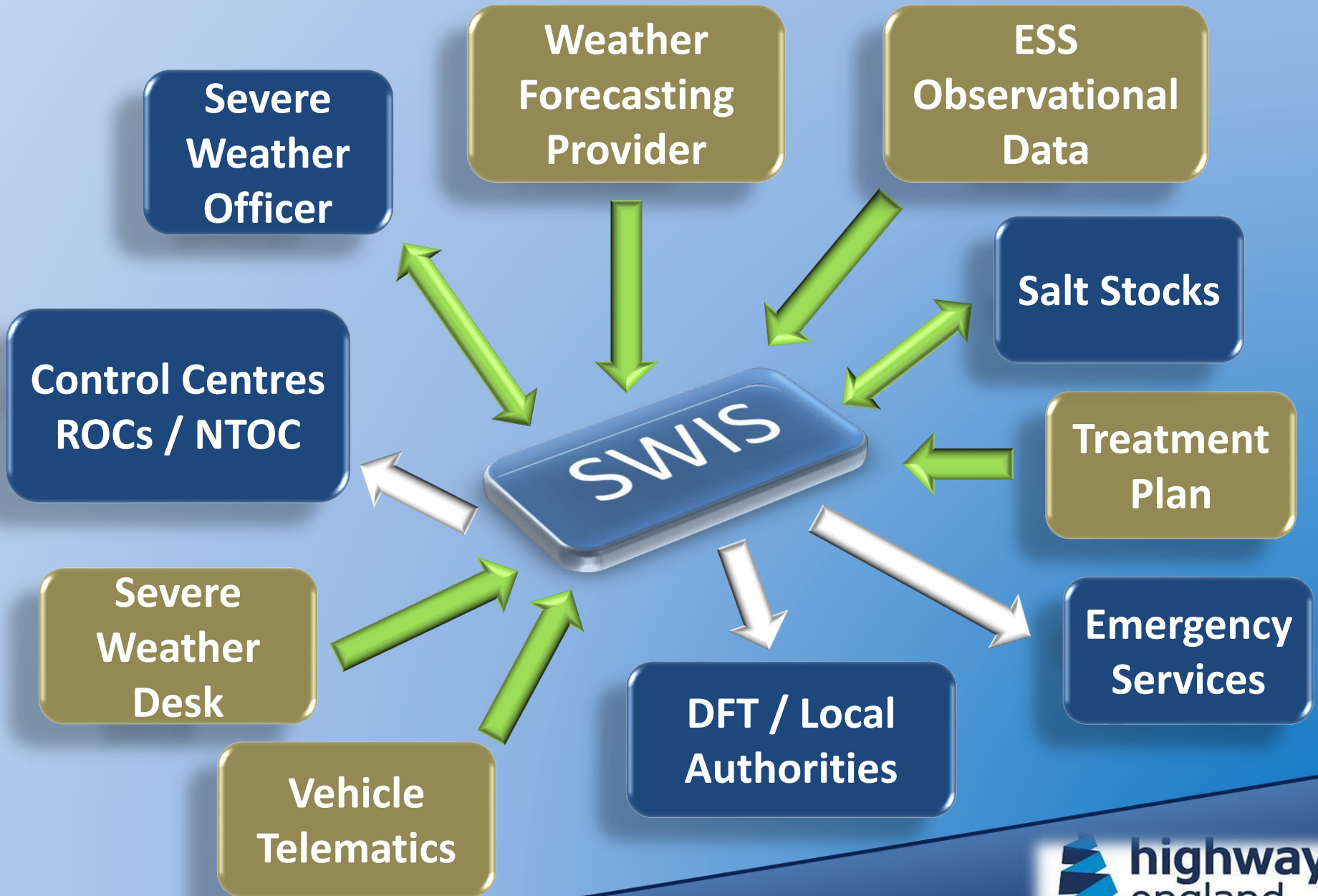
simon.phillips@swis.highwaysen



- Road Surface Temp 1 (O) ▼
- Road Surface Temp 2 (O) ▼
- Road Surface Temp (F) ▼
- Dew Temp (O) ▼
- Dew Temp (F) ▼
- Select Attribute ▼
- Select Attribute ▼
- Select Attribute ▼
- Cloud Amount (F) ▼
- Road Surface State 1 (F) ▼
- Road Surface State 1 (O) ▼
- Select Attribute ▼
- Save
- Clear All

# SWIS Typical Site Specific Graph

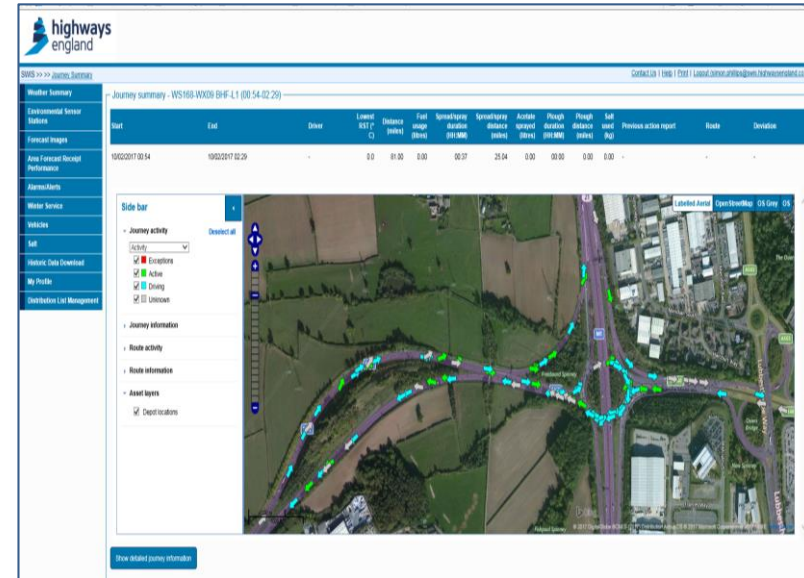
# Severe Weather Information Service (SWIS)





# Driver Navigation

- Driver navigation fitted to winter fleet
- Based upon Exactrak system
- Data provided through SWIS
- Adherence to winter routes
- Audio visual route guidance
- Any driver can drive any route
- Ensures delivery of salt as designed
- Compliance reporting



# The Regional Operations Centre (ROC) & The Severe Weather Officer



# Roles & Responsibilities



## The Regional Operations Centre Provides

- 24/7 availability
- Hub for decision making and monitoring
- Access to a range of technology & communications systems

## Severe Weather Officer (SWO)

- Receiving and reviewing the 24hr weather forecast
- Developing treatment plans & instructing the Service Provider
- Reviewing observational data and ensuring treatment plans remain valid
- Communicating with stakeholders
- Receiving and reviewing treatment data to ensure successful delivery

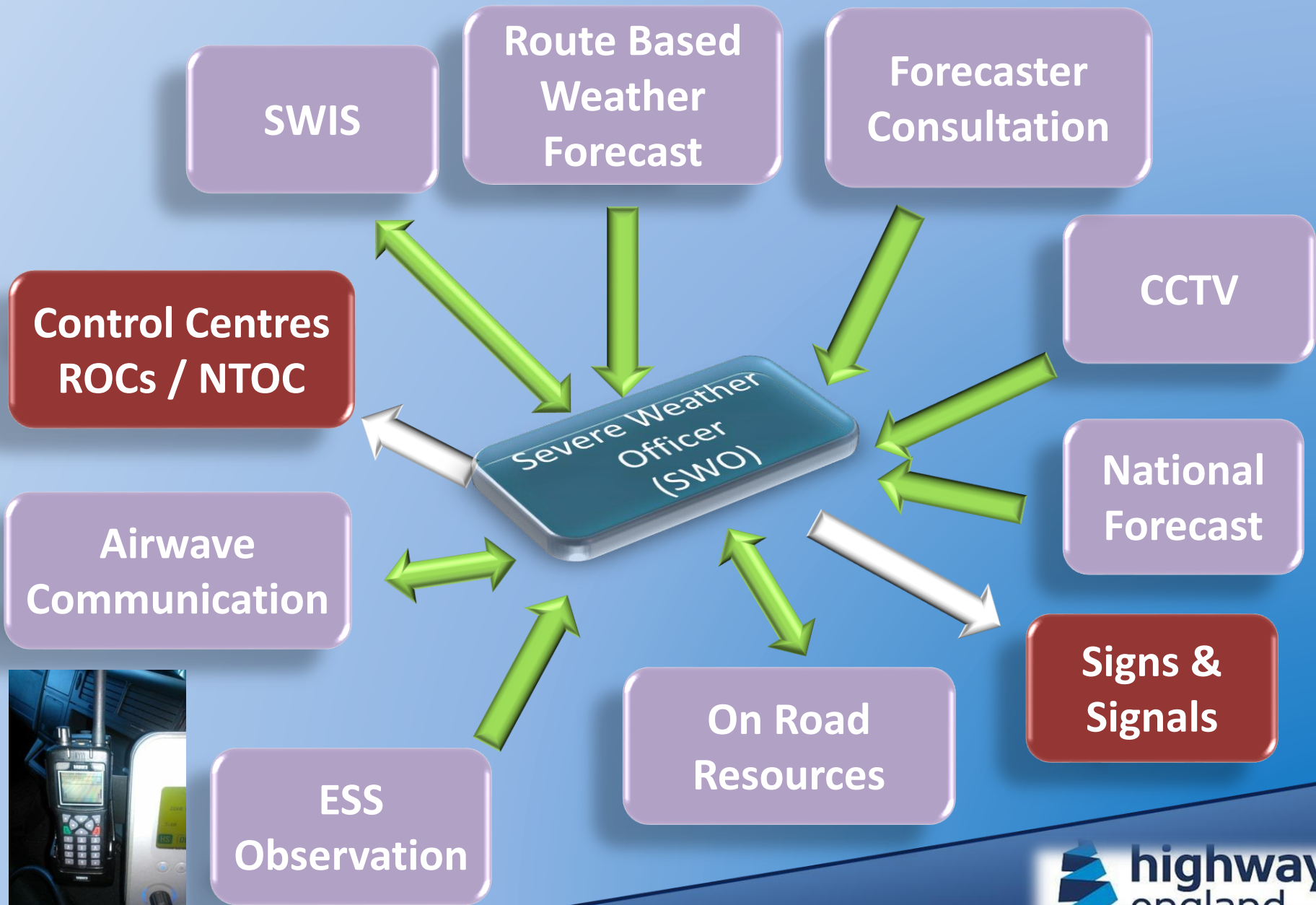
## Severe Weather Verifier (SWV)

- Reviews 24hr weather forecast
- Independently develops treatment plan
- Reviews treatment plan with SWO to obtain consensus (verification)
- Verification is a process hold point!

## M&R Contractor (Service Provider)

- Supervisor will receive notification from the SWO verbally, via SMS text and through Asset Management System. Responsible for delivery of the treatment plan

# ROC Technology / Communications



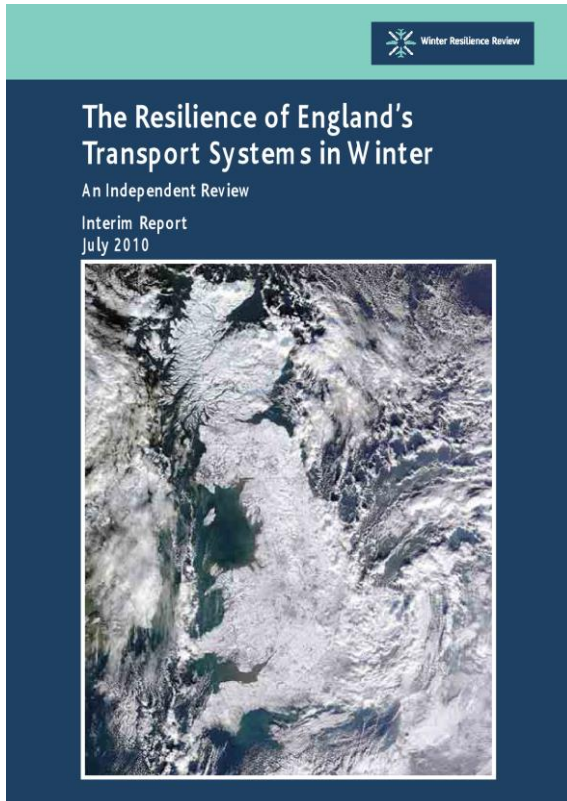
# Treatment Matrix

- Severe Weather Plan Template
- Used to develop Treatment Plans
- Defines precautionary treatment based upon
  - Weather conditions (Hazards)
  - Road Surface Conditions
  - Road Surface Temperature
- Pre-wet and dry options 8g/m<sup>2</sup> to 20g/m<sup>2</sup>
- Preferred treatment is pre-wet
- Provides additional guidance for
  - Wet conditions,
  - Residual salt
  - Temperatures below -7deg
- Treatment threshold – may fall below +1deg

	Weather Conditions Road Surface Conditions Road Surface Temperature (RST)	Air Temp	Treatment	
			Dry Salting (g/m <sup>2</sup> )	Pre-wetted Salting (g/m <sup>2</sup> )
<p>Spread rates for pre-wetted salt are the combined weight of dry rock salt and brine combined at 70:30 proportions by weight respectively with a brine concentration between 20% and 23%.</p> <p>Treatments should be carried out, whenever possible, after traffic has dispersed standing water. Successive high 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.</p> <p>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 -7°C or below -5°C in low humidity conditions (relative humidity &lt;80%).</p> <p>Pre-wetted salt is the preferred treatment for all precautionary treatments whenever possible, including before snowfall.</p> <p>The rate of spread for precautionary treatments may, if appropriate, be adjusted to take account of residual salt or surface moisture.</p> <p>The spread rates are not applicable to very wet roads, when there is standing water or spray generated, or for hard frosts. In these conditions roads should be closely monitored and consideration given to increasing the spread rate, making successive treatments or both.</p>				
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
<p>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.</p> <p>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.</p>				
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)	

# Closer Working With Local Authorities

- Highways England recognises the need to collaborate with Local Authority Partners (Quarmby report 2009/2010)



# Closer Working With Local Authorities



Closer working can take several forms including

- Sharing of facilities
- Cross boundary treatment arrangements - ensure a consistent service
- Sharing of Treatment Plans – SWIS, online platforms, email
- Sharing of salt stocks and storage
- Provision of weather forecast data
- Access to Weather Stations (ESS)
- Snow clearance arrangements – ensure road users can transit between networks
- Full winter service to parts of other networks
- Treatment / snow clearance to support key services (police, hospitals)

# Closer Working With Local Authorities



## Examples of collaboration

- Area 7 cross boundary treatment arrangement with Derbyshire CC
- Sharing of depot facilities in Cornwall
- Sharing of depot facilities in Hereford
- Working with Lincolnshire (One Public Estate) facilities sharing opportunities
- Consideration of treatment of diversion routes in East Midlands
- Snow clearance arrangements with Devon CC – A38 Haldon Hill
- Treatment of A229 & A249 in Kent as a resilience measure



# Closer Working With Local Authorities



- Highways England operates a Mutual Aid Process
- Used to provide or obtain support from local authorities
- Available to deal with immediate requests during stress (Severe Weather)
- Also longer term requirements
- Make contact with your Highways England Region to discuss

**Thank You For Listening**