



# TII Winter Maintenance Seminar

Jason Bolger – BAM Operation & Maintenance  
Manager



# INTRODUCTION



# Introduction

## BAM O&M Motorway PPP Schemes

### ➤ N7/N11 Arklow Rathnew PPP

- 46km Motorway on the M11, from J18 to J23
- Newlands Cross Flyover

### ➤ M11 Gorey to Enniscorthy PPP

- 26km Motorway on M11 from J24 to Oilgate roundabout
- 4km of dual carriageway N30

### ➤ N25 New Ross Bypass PPP

- 5km dual carriageway N30
- 10km dual carriageway N25
- Rose Fitzgerald Kennedy Bridge



## Duration of Contracts

BAM Civil O&M Projects	Duration	Completion
N7/N11 Arklow Rathnew PPP	25 years	2040
M11 Gorey to Enniscorthy PPP	25 years	2044
N25 New Ross Bypass PPP	25 years	2045





## Original Contract Requirements

- The treatment requirements in the Contract for the N7N11 Arklow Rathnew PPP was for dry salt
- After consultation with TII a variation to use full wet brine, pre wet along with dry salt was obtained



# COMPARISON OF APPLICATION TYPES

## FULL WET TRIALS- BAM CIVIL N7 / N11



**Spread Pattern**



**2 hours after Treatment**

# Comparison of application types

## Residual Salt - Full wet v pre wet @ 30g/m<sup>2</sup>

- Pre-wet gives a direct salt saving of 25%.
- Full-wet gives a direct salt saving of 77%.
- Full wet provides a layer of protection between ice/snow and road surface.



# Treatment Types

- Dry salt
- Pre Wet
- Brine

PRECAUTIONARY TREATMENT MATRIX GUIDE			
Frost or forecast Frost Road Surface Temperature (RST) and Road Surface Wetness	Dry Salting (g/m <sup>2</sup> )	PreWet Salting (g/m <sup>2</sup> ) (see Note 1)	Brine Only (ml/m <sup>2</sup> ) (see Note 2)
RST at or above -2°C and dry or damp road conditions	11	9 (of which 7g is dry salt)	15.0
RST below -2°C but above -5°C and dry or damp road conditions	15	13 (of which 10g is dry salt)	22.5
RST below -2°C but above -5°C and wet road conditions	25	25 (of which 19g is dry salt)	30.0
RST at or below -5°C but above -10°C and dry or damp conditions	25	25 (of which 19g is dry salt)	N/A







## Winter Services Road Applications

### Pre Wet Application

- Process of mixing dry salt with brine as it is dispensed from the vehicle.
- Typical Ratio of 70% dry salt to 30% brine
- More adhesive to the road surface.
- More effective than dry salt
- Undissolved salt can still be blown away from the surface





## Winter Services Road Applications

### Full Wet Application

- Brine applied directly to the road surface.
- Completely targeted spread
- Salt already in solution.
- Works immediately upon contact.
- Less material carried or blown off roadway.



# WHAT IS BRINE



## What is Brine?

### Properties of brine

- Water with dissolved salts of any kind is referred to as a brine
- Sodium chloride, calcium chloride, magnesium chloride & potassium chloride
- Typically for roads the salt used is sodium chloride (nacl) because of cost
- Salt added to water significantly lowers the freezing point of the solution
- Excellently suited to road treatment in winter services
- Once brine is made it is a very stable solution
- Anti-icing rather than de-icing



## Vehicles to apply Brine

- BAM Fleet – 2 trucks with 15,000 litres capacity each
- Convert dry fleet to full-wet with bladder inserts



## COMPARISON OF APPLICATION TYPES

### EFFECTIVENESS OF TREATMENTS

Effectiveness in preventative treatments & light de-icing

➤ *Use “Full wet” Treatment*

Effectiveness in heavy wet snow removal

➤ *Use “Pre wet with increasing amount of dry salt”*





## Advantages of Brine

- Reduction in salt usage 75:25
- No blow off from the surface of the road
- Anti icing – layer down to prevent frost, snow sticking to pavement
- Can be delivered at higher speeds
- Less traffic areas are still treated and preformed well
- Less damaging to the environment
- Commercial Benefits – saving on salt, manpower and second runs
- Interventions can be made during working hours



## Disadvantages

- Initial capital cost and upfront investment
- Expensive trucks and equipment
- Until recently all equipment for dispersing the brine had to be imported which had an impact on the after sales care and turnaround
- Significant water supply and storage requirements
- Not an all encompassing process for all winter maintenance treatments



# SUMMARY

## APPLICATION TYPES – COMPARISON TABLE

<b>DRY SALT APPLICATION</b>	<b>PRE-WET APPLICATION</b>	<b>FULL WET APPLICATION</b>
100% SALT COST	25% SAVINGS IN SALT COST	77% SAVINGS IN SALT COST
HUGE LOSSES FROM SURFACE	LESS LOSSES FROM SURFACE	PRACTICALLY NO LOSSES FROM SURFACE
LOW SPREAD SPEED (60km)	BETTER SPREAD SPEED (70km)	BEST SPREAD SPEED (80km)
SECOND RUNS COMMON	REDUCED SECOND RUNS	VERY REDUCED SECOND RUNS
AS LATE AS POSS APPLICATION	EARLIER APPLICATION	EARLY APPLICATION
FULL FLEET	FULL FLEET	POSSIBLE FLEET REDUCTION
FULL SALT STORAGE	REDUCTION IS SALT STORAGE	VERY REDUCED SALT STORAGE
		REDUCED LABOUR COSTS IN OPERATION
		SIMPLER VEHICLE - LESS TO GO WRONG
		BETTER FOR THE ENVIROMENT
		VERY SUITED TO OUR MARGINAL CLIMATE



**Thank you for Listening**

**Any questions ?**