

# Roadmarkings

Site Specific Delineation and Improved Visibility



# Roadmarkings & safety

## Roadmarking the under rated safety measure

- Centre line & edge lines
  - 20% reduction in all accidents
  - 34% reduction in single vehicle accidents
- Must be effective in all conditions
  - Day & Night
  - Dry & Wet
- What factors affect performance?
- How do we classify performance ?



# Roadmarking systems

Roadmarkings are a system

- Solvent based paints
- Water based paints
- Long life markings
- Beads
- Specification covers
  - Properties of materials
  - System performance



# Performance measures

Properties based on needs of the driver

## Retroreflectivity

- Ability to reflect headlight back to driver
- Dry and wet conditions

## Luminance

- Brightness under diffuse light

## Skid Resistance

- Minimum 45 BPN





# Performance Standards

## European Standards

### Performance criteria – white markings

Retro-reflection (dry)		Retro-reflection (wet)	
Class	R <sub>L</sub> Value	Class	R <sub>w</sub> Value
R <sub>0</sub>	NIL	R <sub>w0</sub>	NIL
<b>R<sub>2</sub></b>	<b>≥ 100 mcd</b>	R <sub>w1</sub>	≥ 25 mcd
R <sub>3</sub>	≥ 150 mcd	R <sub>w2</sub>	≥ 35 mcd
<b>R<sub>4</sub></b>	<b>≥ 200 mcd</b>	R <sub>w3</sub>	≥ 50 mcd
R <sub>5</sub>	≥ 300 mcd	R <sub>w4</sub>	≥ 75 mcd

Skid Resistance	
Class	SRT Value
S <sub>0</sub>	NIL
S <sub>1</sub>	≥ 45
<b>S<sub>2</sub></b>	<b>≥ 50</b>
<b>S<sub>3</sub></b>	<b>≥ 55</b>
S <sub>4</sub>	≥ 60
S <sub>5</sub>	≥ 65

Current M7, one value for all conditions

EN 1436 White Road Markings

# Performance Standards

Update to M7

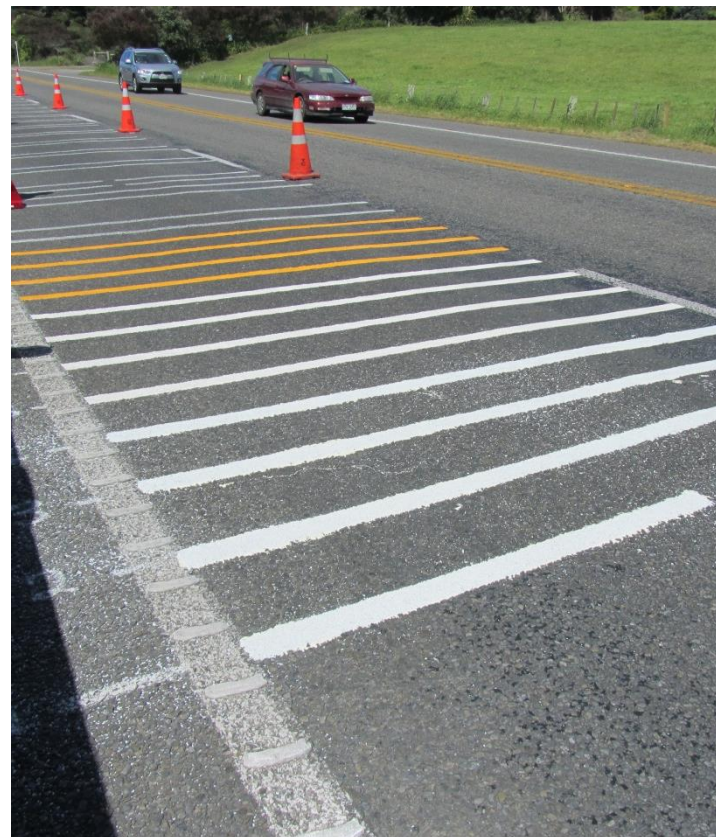
Transverse trials

Laid Nov 2013

Two site – Chipseal and asphalt

Assessed against

- Wear, skid resistance, colour
- Dry  $R_L$ , Wet  $R_L$ , Wet & Dry  $Q_d$



# Performance Standards

## Update to M7

- 2 classes – life in vehicle passes
  - 1.5M – current M7
  - 5M – current M20
- 2 performance levels
  - Dry  $R_L$ , Wet  $R_L$ , Dry  $Q_d$

Separate approval list chipseal & asphalt



# Selection

What to use where

## Wear Class

Based on factors related to wear including:

- AADT
- % Heavy vehicles
- Road geometry

## Performance Rating

High performance where improved delineation identified by safety strategy  
e.g. high speed zones, no overtaking zones...

## Surface

Low texture (slurry, asphalt).  
High texture (chip seal)



# Performance Standards

## White materials

Performance Category	Dry $R_L$ mcd/m <sup>2</sup> /lux	Wet $R_L$ mcd/m <sup>2</sup> /lux	Dry $Q_d$ mcd/m <sup>2</sup> /lux	Wet $Q_d$ mcd/m <sup>2</sup> /lux
High Performance	150	80	120	120
Basic Performance	100	35	80	80

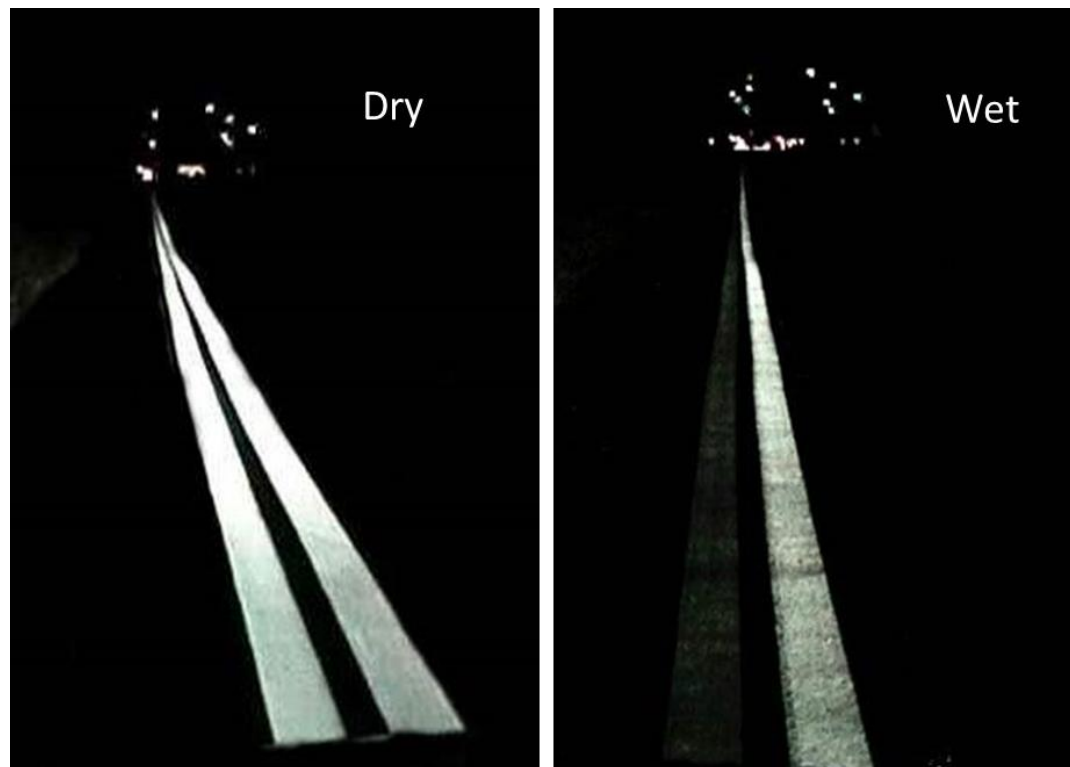
## Yellow materials

Performance Category	Dry $R_L$ mcd/m <sup>2</sup> /lux	Wet $R_L$ mcd/m <sup>2</sup> /lux	Dry $Q_d$ mcd/m <sup>2</sup> /lux	Wet $Q_d$ mcd/m <sup>2</sup> /lux
High Performance	120	60	80	80
Basic Performance	75	25	60	60

# Wet night visibility

## Benefits of better visibility

- Wet condition the most difficult environment for drivers
- Roadmarking can play a critical role
- Better wet visibility means:
  - Better lateral lane control
  - Better speed control
  - Less mentally demanding on driver
  - Less frustration



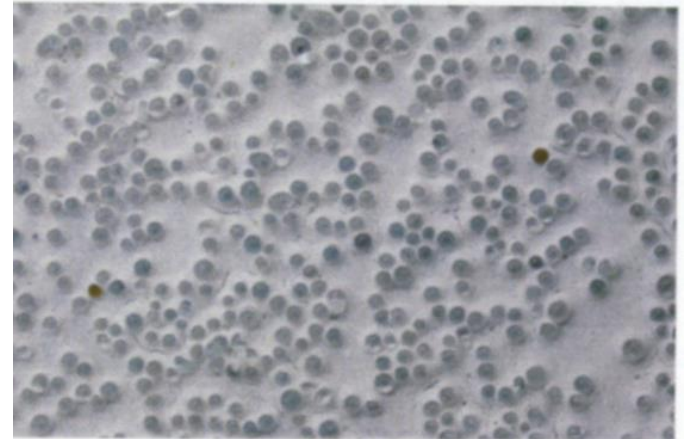
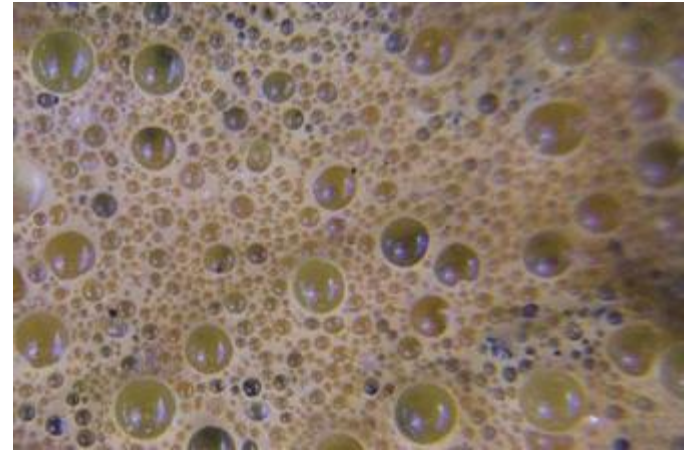
Photos : Potters Industries

# Wet night visibility

## How to achieve better visibility

Values achievable through

- Bead selection
  - Thicker paint films
- 
- Larger beads – better wet recovery
  - Thicker paint films for bead retention
  - Depending on system could affect drying times
    - Protect lines for longer
    - Additional traffic control



# What is possible

## Supplier nominated systems

Location	Retro Results After ~9months Traffic	
	Dry Reading Average	Wet Reading Average
Site 1 (rough chipseal)	408	198
Site 2 (smooth seal)	590	294

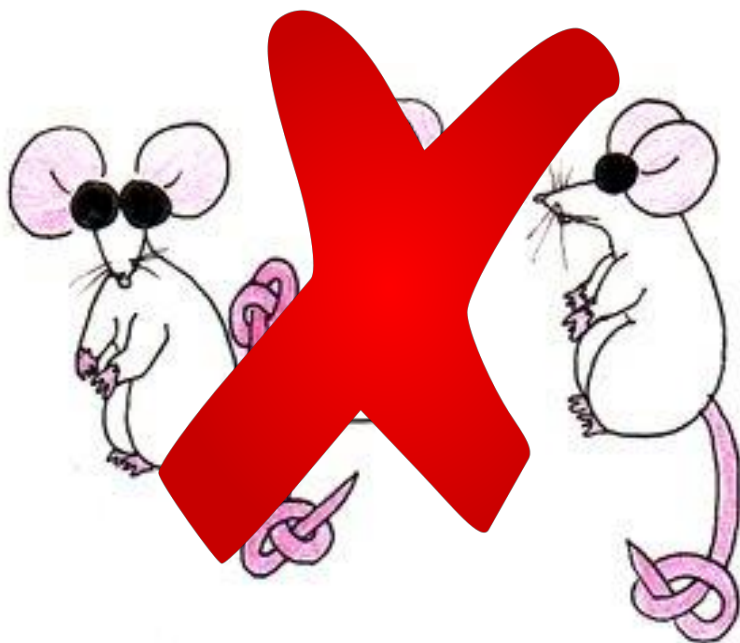


Location	Retro Results After ~3months Traffic	
	Dry Reading Average	Wet Reading Average
Site 2 (Waterborne Paint, smooth seal)	308	35



# What are we getting

Check that we get what we asked for.



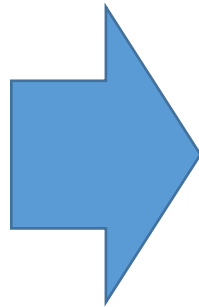


# What next

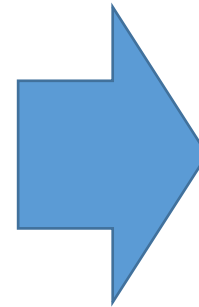
Engagement on delineation

Delineation Advisory Group

- Local Authorities
- NZTA
- Suppliers
- Contractors



- Gaps
- Education
- Profile
- Direction



- Innovation
- Efficiency
- Value
- Safety



# Want to know more

Your friendly NZTA Pavements & Surfacing Team are here to help

Robert Busuttil

Principal Surfacing Engineer

(04) 910 2553

[Robert.busuttil@nzta.govt.nz](mailto:Robert.busuttil@nzta.govt.nz)



Thank you

