Talking today about the soon to be released NZTA roadmarking materials specification
Roadmarkings are often taken for granted,

But we know that the presence of road markings contribute to safety

Many studies showing a crash reduction benefit.

Federal Highways Administration Crash Modification Factor Clearinghouse (FHWA 2012)

Austroads Road Safety Engineering Toolkit (Austroads, 2012a)

Effectiveness of Road Safety Engineering Treatments, (Austroads, 2012b),

The Handbook of Road Safety Measures (Elvik et al, 2009)
Specification needs to cater for the fact we want road markings to perform under a variety of conditions,

Day and night, Dry and wet

We assess these products against our M7 specification

Give a brief run down on some performance factors
Materials specifications, broken into paints under M7 and long life materials (CAP, thermoplastic) under M20

Standard measures of wear, colour, skid, luminance and durability assessed via a transverse field trial

Retroreflectivity (30 metre), one level, dry only
New specification incorporates paints and high build materials (CAP, Thermoplastic)

Additional retroreflectivity requirements

Two levels of performance standard which reflects current practice and high

Have also added Wet retroreflectivity requirements
To provide some background European standards En 1436

Where does NZ sit on this scale

Current M7 spec criteria the low end,
New values presented here,

These are end of life.

High visibility comes from desire to improve performance

Gives network managers option to improve marking performance, at sites say where accident history

Maintain standard visibility, current practice understand may still appropriate in some circumstances considering also used by Local govt.
Update to M7 approved products list

Approval process involves transverse road trials across two sites

Chip seal which is widely used in NZ and asphalt

Markings do behave differently on different surfacings
- Chipseals – wear
- Asphalt – wet $R_L$

Laid in 2013 and completed late 2016, up to 5 million vehicle passes

Assessed against retroreflectivity, wear, skid resistance, colour
Wet condition the most difficult environment for drivers, sure many of us have had trouble seeing roadmarking in the wet.

Improving marking visibility has numerous benefits.

See in the photo the impact of water, in the wet line in left poor retro while line on right still clearly visible.
FHWA report (Safety Evaluation of Wet Reflective Pavement Markers, FHWA 2015) find a link between reduced crashes and improved wet retroreflectivity

Recommended Crash Modification Factors for wet reflective markings

Applied to NZ translates to a 5% crash reduction

BCR varies with traffic volumes but range from 4 up to 25 depending on ONRC
Larger beads (Type D vs Standard Type B) and the type of glass have an effect on wet visibility.

- Greatest benefit on low textured surfacings such as asphalt
Classified products according to visibility and durability, how long that visibility level can be achieved.

<table>
<thead>
<tr>
<th>Surface type</th>
<th>Asphalt</th>
<th>Chip seal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product durability</td>
<td>Normal</td>
<td>Extended</td>
</tr>
<tr>
<td>High Visibility</td>
<td>AN1</td>
<td>AE1</td>
</tr>
<tr>
<td>Standard Visibility</td>
<td>AN0</td>
<td>AE0</td>
</tr>
</tbody>
</table>
Selection will need an understanding of site, traffic and necessary performance.

Developed Guidance on:

When higher durability products may be warranted,

When high levels of visibility are needed, looking at high traffic volumes (> 10000) on undivided roads
In implementing changes the need to engage with industry and users recognised

Established an industry advisory group

Delineation advisory Group, DAG for short

Purpose is to provide impartial guidance, advice and strategic direction on delineation

Achieve the best outcomes for New Zealand road users in terms of safety and value.
Make up of the Delineation advisory group

Purchasers – responsible for specifying and managing
Suppliers – product knowledge,
Applicators - application knowledge

Draw on expertise from across industry, range of perspectives
Need for a more rapid and flexible method to approve product

Considering several options

One is accelerated wear of markings in a laboratory environment

This is a device developed by Opus, called a Circular Accelerated Surface Tester (CAST)

Advantages in terms of time and reproducibility

Does not take into account environmental effects.

May be a first gate in approval process
Conclusion

Recognition of safety benefits of road marking

New specification raise standards for markings on NZ roads

Review approval process, reduce lead time for introduction of new products
Thank you