



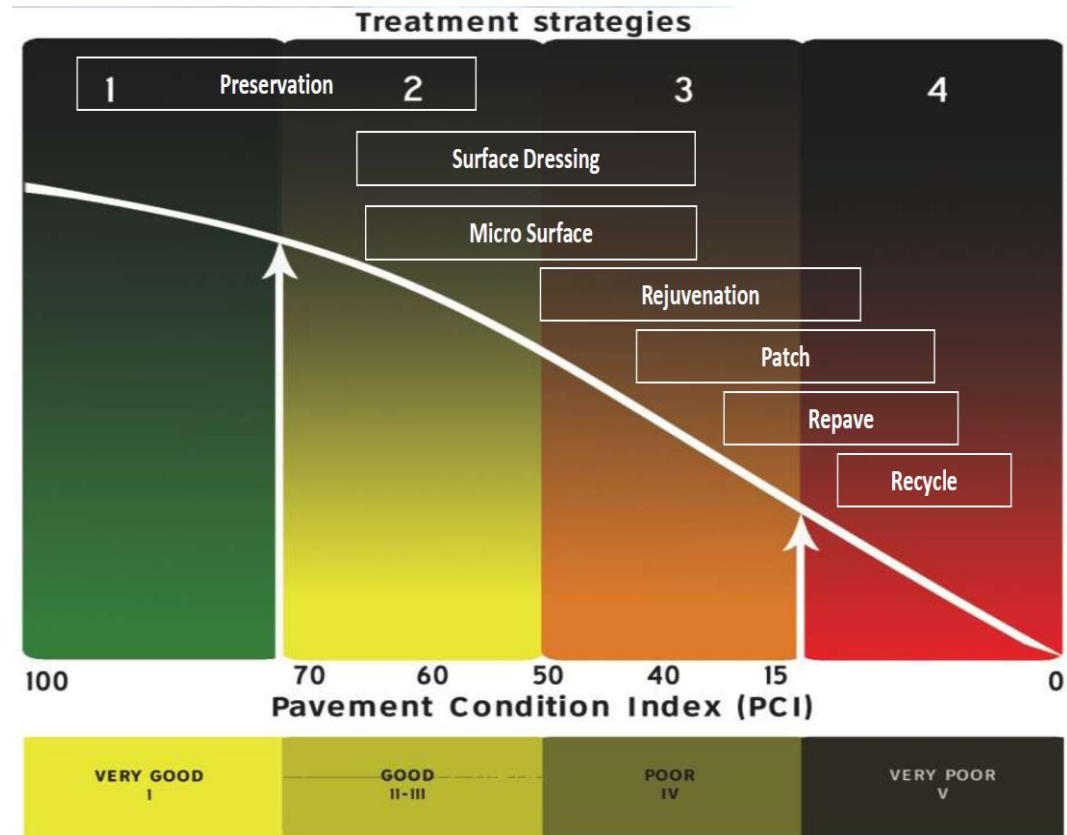
Use of cold-spray-applied
solution to extend the life of
bituminous pavements

Madrid, 25 May 2016



1- The importance of correct preservation of the pavement

- Pavement interventions:
 - ✓ Disruptions to mobility.
 - ✓ Environmental impact.
 - ✓ Financial expenditure.
- Average life expectancy of bituminous pavements: 8 to 12 years.
- Importance of a long term strategy for the maintenance of the pavement.
- Preservation: Retaining the surface in good condition, acting before failure.
- Objective: Invest early to delay the major reactive interventions.



2- Case Study: Globalvia's motorways in Ireland

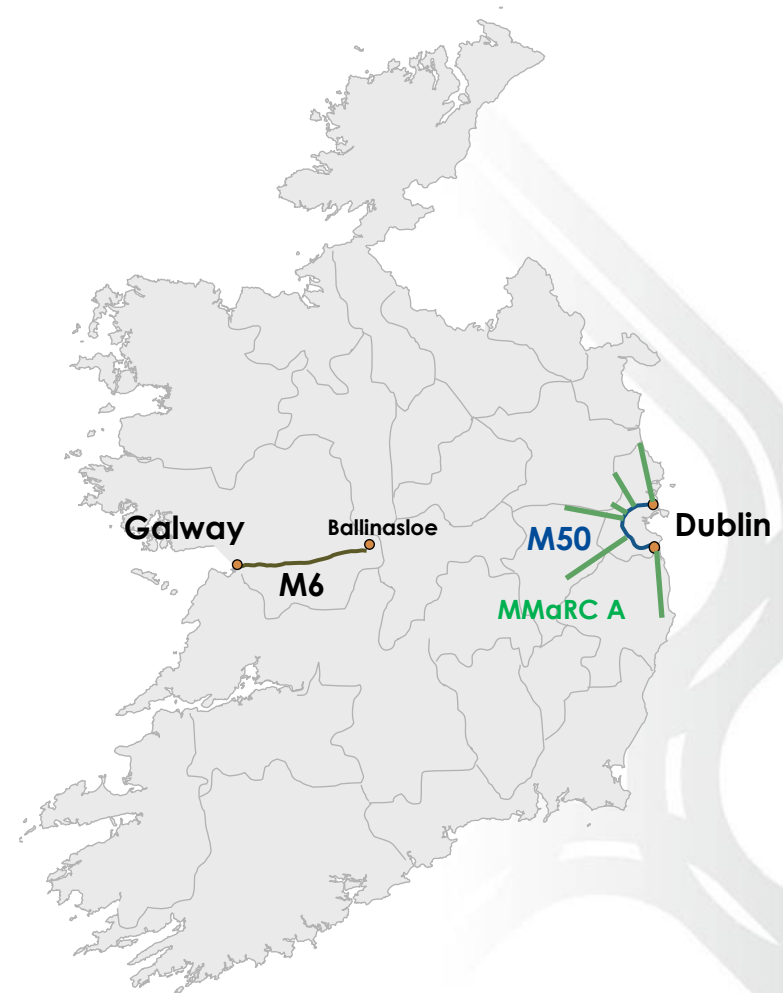


IRELAND

- M50 Motorway (Dublin)
- MMaRC Area A (Dublin Metropolitan Area)
- N6 Galway to Ballinasloe

Key data

Client	Transport Infrastructure Ireland (TII)
Total Length	256 km
Type	Motorways
Traffic (AADT)	From 11,000 to 130,000
Pavement	Flexible Surface: TSCS(SMA)/HRA



2- Case Study: Globalvia's motorways in Ireland

- Pavement Preservative Materials had never been used in Ireland before.
- Not approved yet by TII.
- Usually cold-spray-applied solutions.



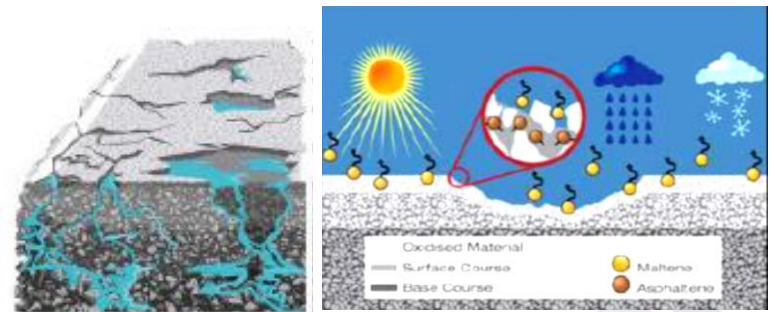
3- Pavement Preservative Materials

- Cold-spray-applied solution??



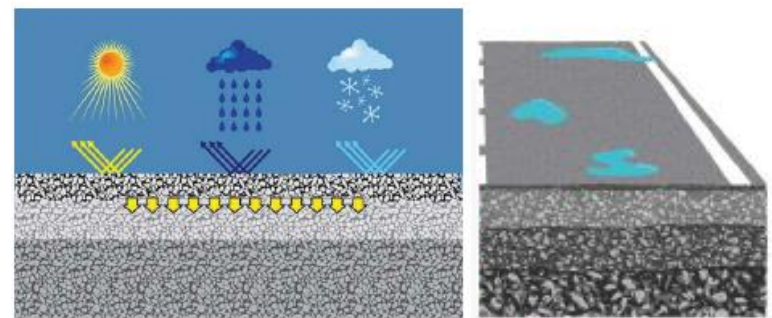
3- Pavement Preservative Materials

- Bitumen is an oil based material and loses lighter volatiles due to exposure to UV light.
- Over time as the lighter volatiles (maltenes) are lost, the asphalt becomes harder and brittle.
- Cracking, ravelling, stone loss, water ingress- Failure.



Rhinophalt System

- Solution of Gilsonite, bitumen, diluents, plasticisers and fine graded grit (mainly Silica & Aluminium Oxide).
- It penetrates in the top few mm of the surface and integrates with the binder (Not extra on top coating).
- The solution acts as a “sun and anti-aging cream” for the pavement, sealing the lighter oils.



4- Application process

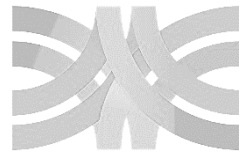
- Conditions: Dry and swept pavement, surface temperature 5°C and rising.
- The fine grit is applied at the same time as the preservative using an integral spray tanker.
- The fine grit is used to achieve initial minimum grip values whilst abrading away the bituminous film at the aggregate surface.
- Application rates:
 - Preservative: 0.5 litres per m².
 - Grit: 0.5 kg per m²
 - Speed: 5.5 km per hour
- The preservative solution penetrates and dries into the surface course, usually within 2hrs.



5- Testing program

- Trial wearing course: SMA 10 PMB 65/106-60 des PSV.
- Coring and Testing of Recovery Binder:
 - ✓ Rheology: Needle penetration test & Softening point test (Ring and ball): Key to measure the life expectancy of the pavement- As the binders age they harden and penetration and softening point reduce.
 - ✓ Scuffing Test: Key to measure the surface abrasion and aggregate loss.
- Performance testing (Expected impact):
 - ✓ Hydraulic Conductivity (in-situ): Reduced
 - ✓ Surface Texture (MPD): Unaffected
 - ✓ Ride Quality (IRI): Unaffected
 - ✓ Rut Depth: Unaffected
 - ✓ Skid Resistance (SCRIM & Skid Pendulum): Unaffected (thanks to grit)





6- Cost benefits

- Preservation treatment: Delays but not avoids degradation.
- Requires re-application after 5-6 years.
- Road marking&studs need to be masked /refresh with each application.
- Comparison vs Surface replacement (35 mill&fill)
 - ✓ Implementation Costs: Aprox. 25%
 - ✓ Productivity: Aprox. 10 times higher
 - ✓ Carbon Footprint: Aprox. 6%
- Next steps:
 - ✓ Complete 2-year test program
 - ✓ Analyse results and verify assumptions
 - ✓ Request the product approval by the TII
 - ✓ Roll out its implementation in Ireland



7- Conclusion

The future of pavement maintenance should be based on preservation in order to meet the growing demand for availability and sustainability in our motorways



Thank you for your attention