**Pavement Recycling for Climate Resilience and Carbon Footprint Reduction**

Pavement design in New Zealand traditionally relies upon locally won moisture sensitive aggregate pavement layers which are constructed to protect the moisture sensitive subgrade. The aggregate then typically relies on chip embedded into 2-4mm sprayed bitumen for waterproof surfacing. This surfacing is intended to protect the underlying support materials from moisture. Experience and research tell us that chip seals (even multiple seal layers) leak and that the biggest threat to performance of unbound aggregate pavements is water infiltration. This pavement construction philosophy leads to high whole of life maintenance demands at the best of times, and in recent times with limited budgets, unprecedented weather patterns, increasing vehicle loadings and road user disruption alongside logistical/operational difficulties around renewals we are seeing evidence that existing levels of resilience are not sufficient for the conditions our network is facing.

Recent changes to pavement design protocols have seen more robust (i.e. asphalt, foamed bitumen and HiLab) treatments proposed for high traffic / climate sensitive pavement works, but for the majority of pavement design work, it is still lowest cost that drives the treatment selection.

It is time to place more emphasis on resilience in the roading network and working with the existing infrastructure material to help mitigate the impact of potential climate events, reduce consumption of finite resource, reduce maintenance disruption, maintain a safe pavement and be sustainable when looking at holistic whole of life costs to determine optioneering.

This presentation will look at ensuring climate resilience by reducing moisture susceptibility of the roading network, subsequently reducing dependence on a thin bitumen film to protect the underlying pavement. It will also look at how recycling can reduce the embodied carbon emissions for a project and what industry is researching and developing to further reduce this impact on the environment.