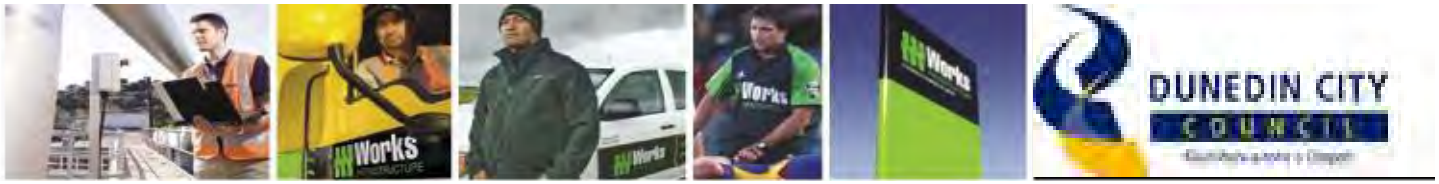


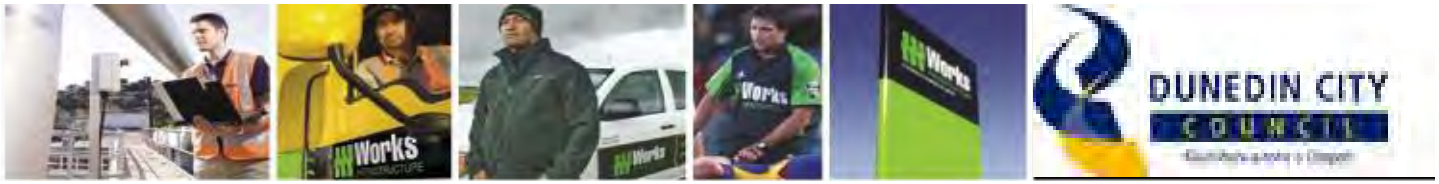
Calcium Magnesium Acetate

as a de-icing/anti-icing agent

on local authority urban roads

in Dunedin

Paul Howard and Fred Coralde



Introduction

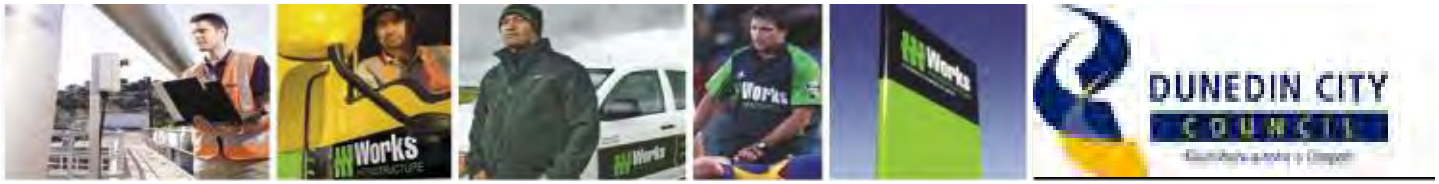
Winter maintenance activities in Dunedin are quite extensive due to the geographical location. Winters here involve many frosts that require reactive maintenance to ensure road user safety.

- Dunedin City Council is actively seeking to enhance its winter maintenance programme with the use of CMA.
- This presentation is in two parts:

  – Strategic Planning
  – Fred Coralde, Dunedin City Council

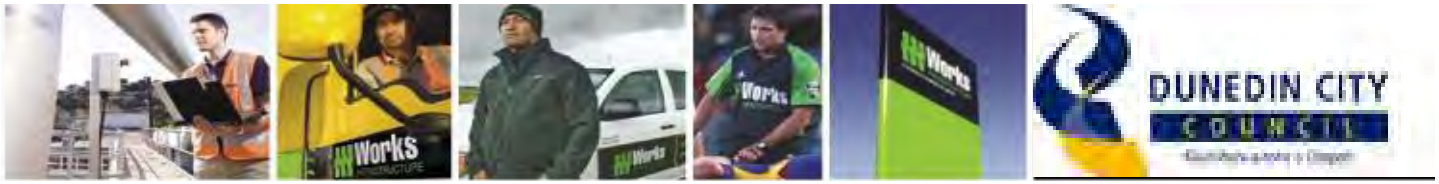
  – Operational Aspects
  – Paul Howard, Downer EDi Works

STRATEGIC PLANNING



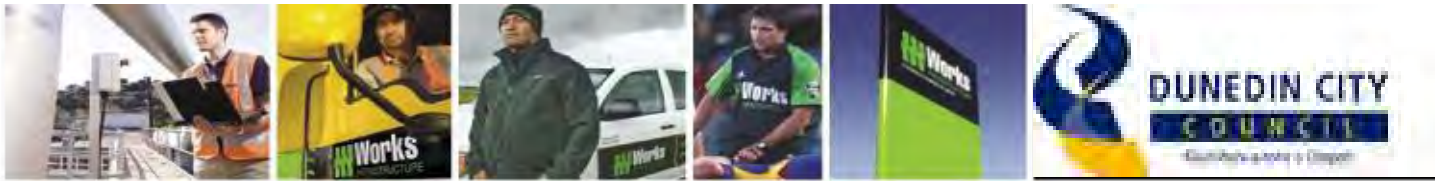
Why bother?

- current policy working perfectly
- rate payers do not know
- is it worth trying?



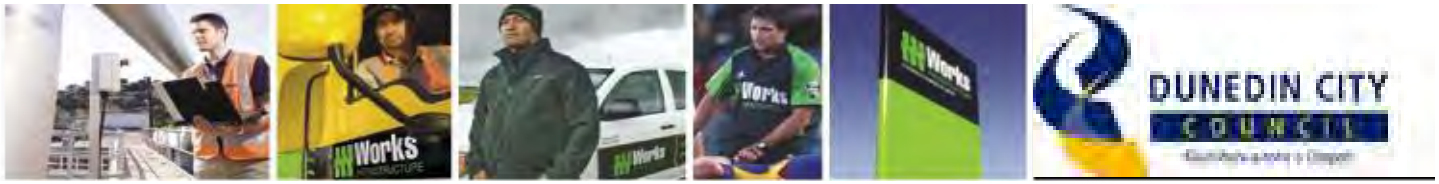
Council's approach

- roads are narrow and rolling
- improve the levels of service
- increasing road safety awareness profile
- long term LTCCP strategy



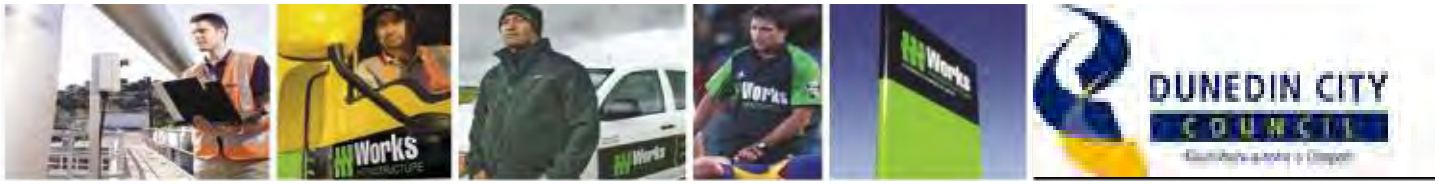
The 2006 trial

- resource consent
- roads affected
- the strategy



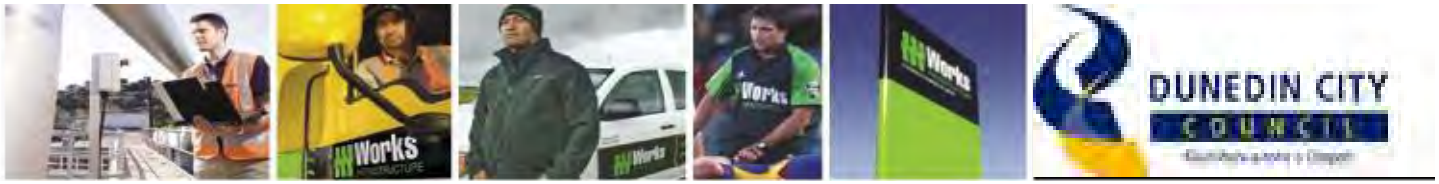
The result…..

- public initial perception
- the positive ‘buying-in’
- environmental report
- the disadvantages

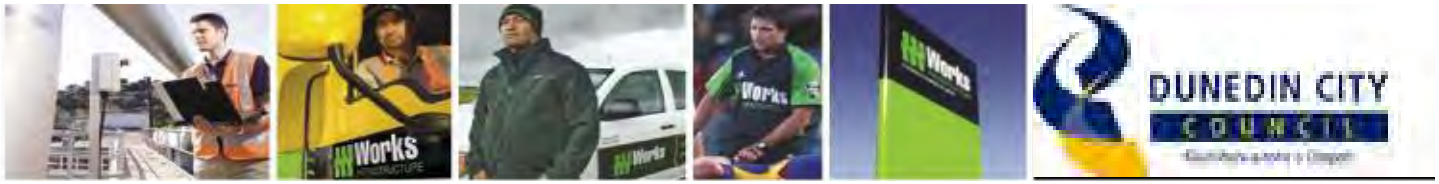


Strategy developed

- trial continuity
- the expansion strategy
- desired outcome

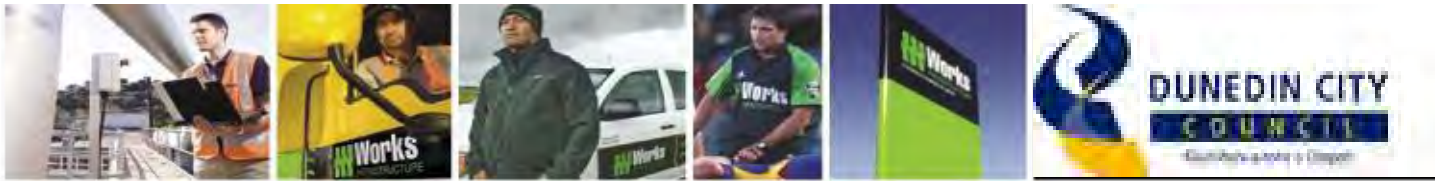


OPERATIONAL ASPECTS



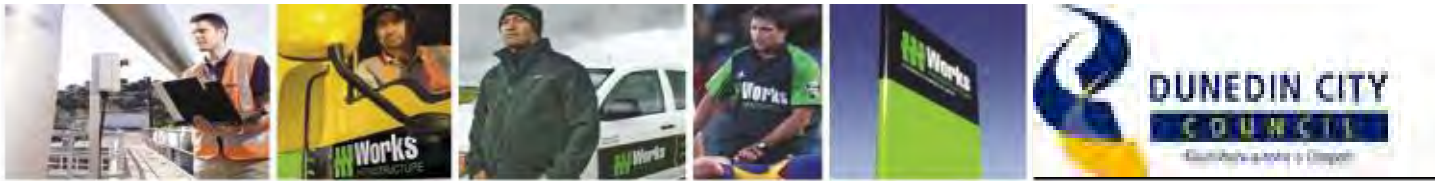
CMA vrs Grit

- Calcium Magnesium Acetate – de-icing/anti-icing agent applied in pellet form or dissolved to form a liquid (common in NZ).
- CMA as an anti-icing agent remains active on the road for up to five days weather permitting.
- CMA allows forward planning and is safer to apply in dry conditions.
- CMA is visually difficult to detect so driver confidence lowers.
- Grit is a cheaper raw material (low initial capital).
- Grit used historically as a mechanical prevention to skidding on ice.
- Grit is a reactive treatment and is very abrasive to road markings it also needs to be collected or will fill mudtanks.



Objectives

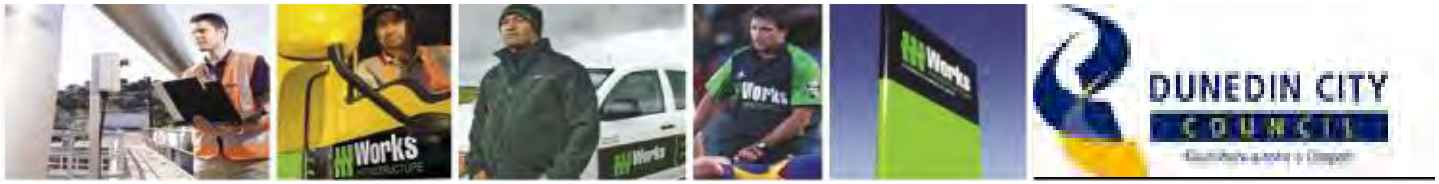
- Meet the needs of the Dunedin City Council
- Improve knowledge of CMA abilities and applications
    - lower PSV chip
    - urban environment, lower speed, alignment.



Methodology

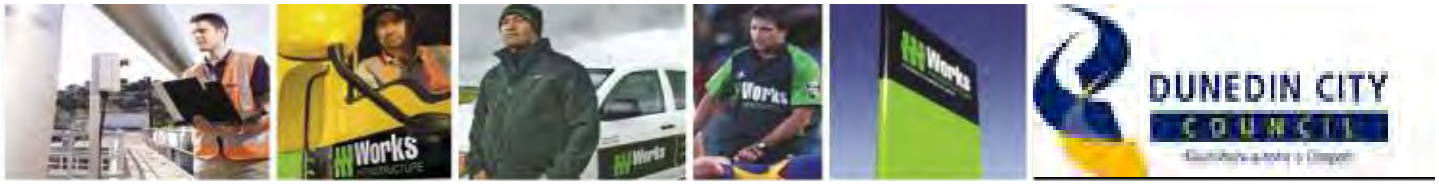
- Vehicle was a Toyota Corolla fitted with a Vericom VC3000, ABS system disabled.
- Tyre size, type and pressure recorded.
- Vehicle speed was 30km/hr.
- Selected sites were:

#	Locaton	Surface	Slope (deg)
1	Stevenson Rd	Mix 6 Asphaltic Concrete	1.7
2	Stevenson Rd	Type 2 Slurry Seal	2.1
3	Stuart Street	Mix 10 Asphaltic Concrete	7.1
4	Three Mile Hill	Second Coat seal (Gr4) –Worn, in good condition	0.3
5	Three Mile Hill	Second Coat seal (Gr4) – Worn, flushed areas	0.3
6	Taeiri Rd	Two Coat seal (Gr 4/6) – Worn, in good condition	5.9

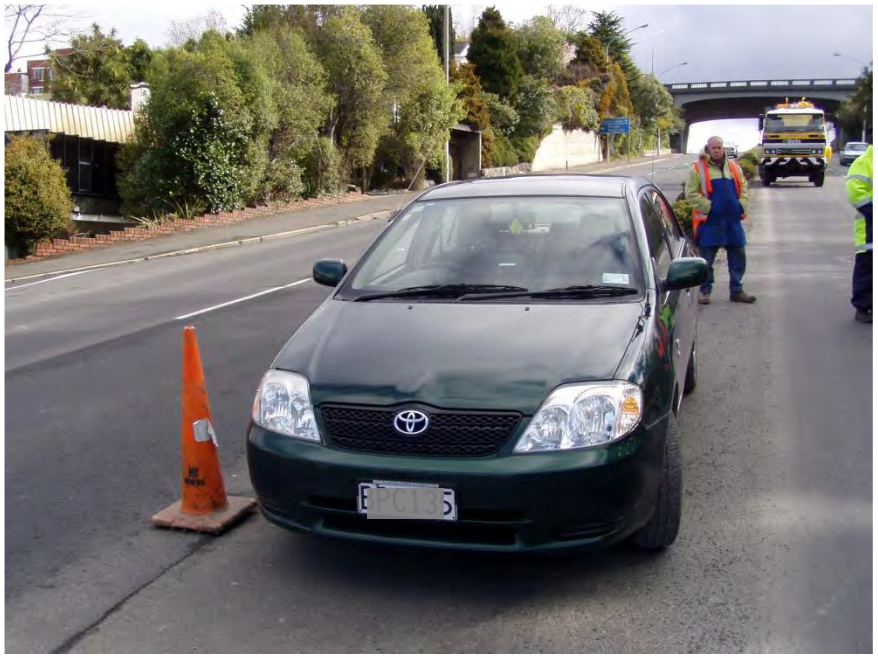


Methodology continued

- Sites selected based on surface type and location.
- Sequence of testing:
  - an untreated state
  - after gritting (road then swept)
  - immediately after CMA application
  - post CMA application, after drying.
- Locked Wheel Braking (LWB) used as test method.
- NZ Police driver and Police measuring equipment used.

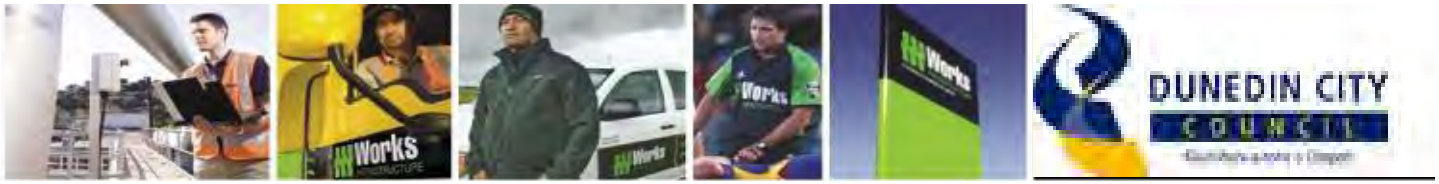


The Setup



Results

Average Stopping Distance (m)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
Asphalts
Chipseals
No Treatment
Grit
CMA (Post Application)
CMA (Dry)
Stevensons Rd
(Mix 6 AC)
Stevensons Rd
(Type 2 Slurry)
Stuart St
(Mix 10 AC)
Three Mile Hill
(Second Coat Gr 4)
Three Mile Hill
(Second Coat Gr 4)
Taieri Rd
(Two Coat Seal - Gr4/6)



Conclusion

- Grit significantly increased average stopping distances
- The increase in stopping distance was more significant on the finer textured asphalt and slurry surfaces
- CMA (post application) performed better on average than grit
- CMA (dry) performed better on all surfaces than a dry untreated road.

Downer EDi Works

DUNEDIN CITY COUNCIL