Polished Stone Value Extended Polishing

Terry Boyle
New Zealand Transport Agency Tauranga


OF YOUR CHARITY
PRAY FOR THE REPOSE OF
THE SOUL OF
JAMES NICHOLAS SIMS
DIED 20·6·1976, AGED 79 YEARS.
LOVED HUSBAND OF
MARY
DIED 28·10·1982, AGED 84 YEARS.
R·I·P

Introduction

Pavement Surfacing Whole of Life

- Extended surfacing life
- Emphasis on aggregate selection
- Can polishing life be determined?

Presentation

- Describe the PSV 12 extended polishing test methodology
- On site testing
- Analysis and conclusions from the testing information


Bay Of Plenty

Bay of Plenty Network Description

- Bay of Plenty SH 760 Kms of State Highway
- Traffic volume range : 500 to 34,000 per day
- Heavy Commercial Vehicle: 90 to 2300 per day
  (serves New Zealand's largest sea port)
- Terrain; plains to mountainous


Waioeka River

Aggregate Polishing

Former T/10 Specification reliance on PSV

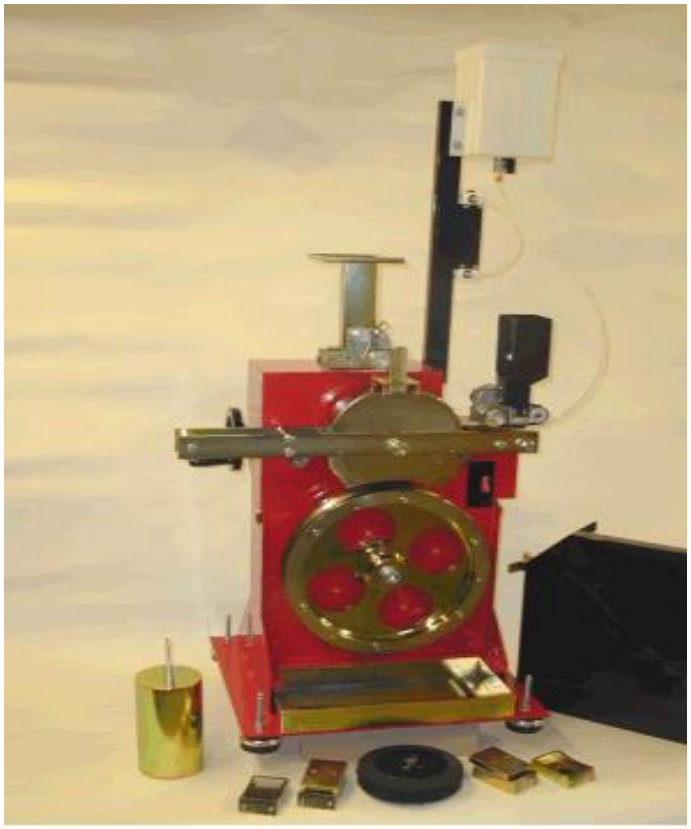
Lack of guidance lead to little awareness of aggregate polishing performance

Aggregate performance method in revised T/10 Spec

i.e. Back analysis of onsite performance

Extended PSV Polishing (Polishing Indicator)

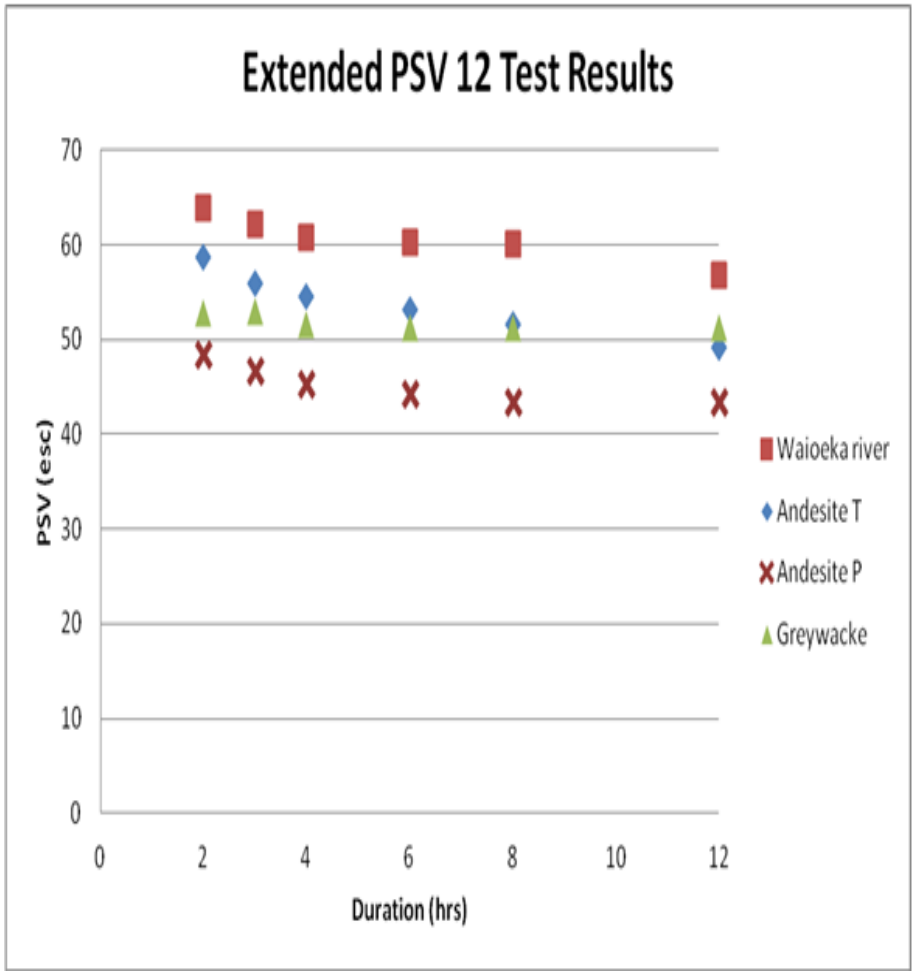
- PSV testing contained in the New Zealand Transport Agency's specification M/6 Notes - BS EN 1097-8:2009
- Aggregate sample on a curved mould, the surface is subject to three hours of coarse polishing, followed by three hours of fine polishing.
- Friction of the polished aggregate is measured by British Pendulum Number (BPN) at 3 hours of fine polishing
- However, PSV value is indicative and the aggregate may well polish further
- Number of aggregate types selected and subjected to fine polishing regime with polishing times of 2,3,4,6,8 and 12 hours



Accelerated polishing testing machine

British pendulum tester

Rock Type


Extended PSV 12 Test Results
PSV (esc)
70
60
50
40
30
20
10
0
0
2
4
6
8
10
12
Duration (hrs)
Waioeka river
Andesite T
Andesite P
Greywacke

Onsite Performance

- Could extended PSV polishing substantiated from onsite performance monitoring
- Curves - Out of Context Curve (OCC) - were investigated for change in their Equilibrium SCRIM Coefficient (ESC) over time
- OCCs were established by the Risk Ranking of Curves
- This is a relatively consistent method of identifying OCC, in that its basis was that the approach vehicle speed over the preceding 500m, was greater than the design speed of the same curve (25kph speed change considered severe)
- ESC of these curves averaged and plotted by year

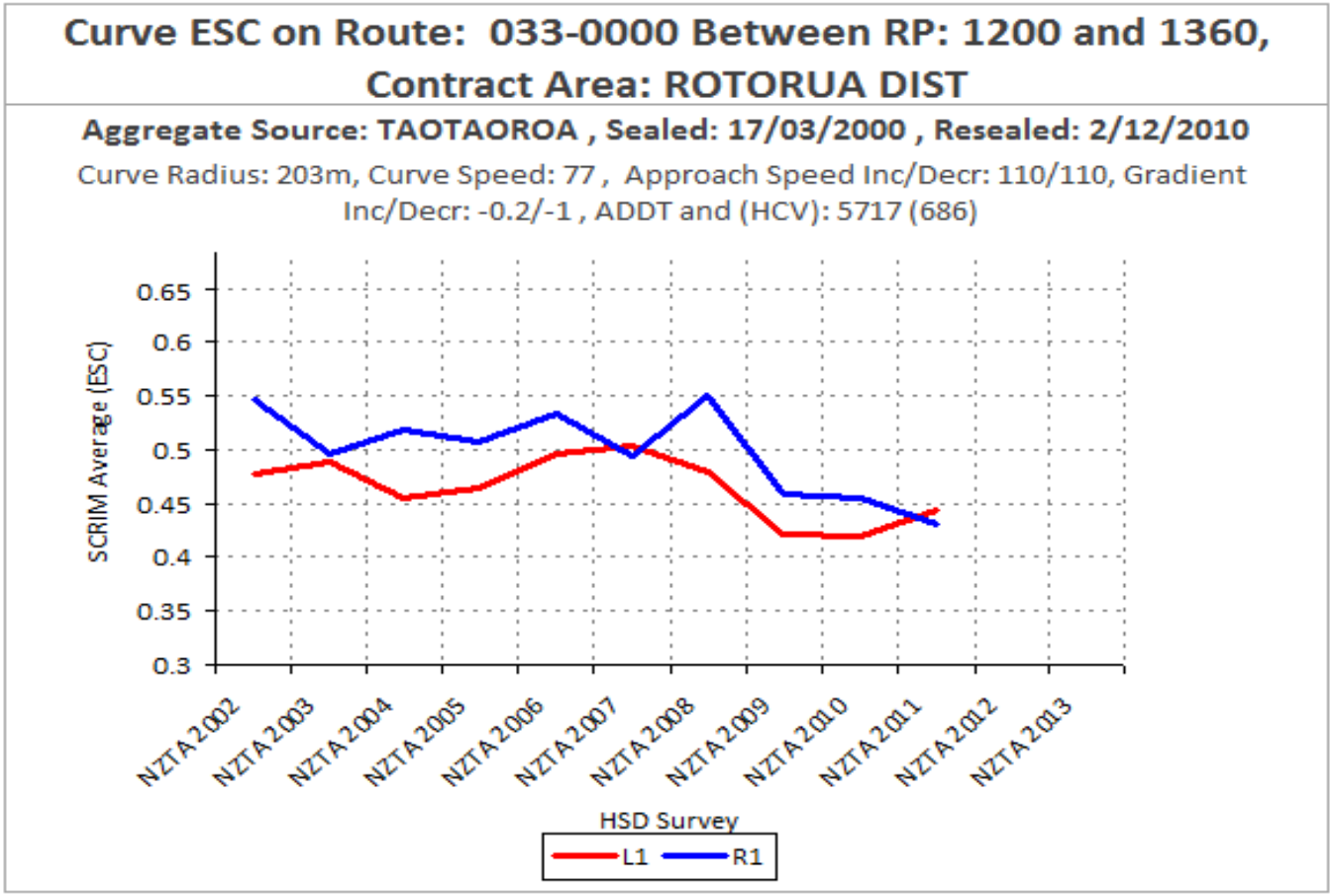


Figure 3 Example of OCC ESC average over time.
The rate of ESC decay per year was 0.006 and 0.014 for the left lane and right lane respectively..

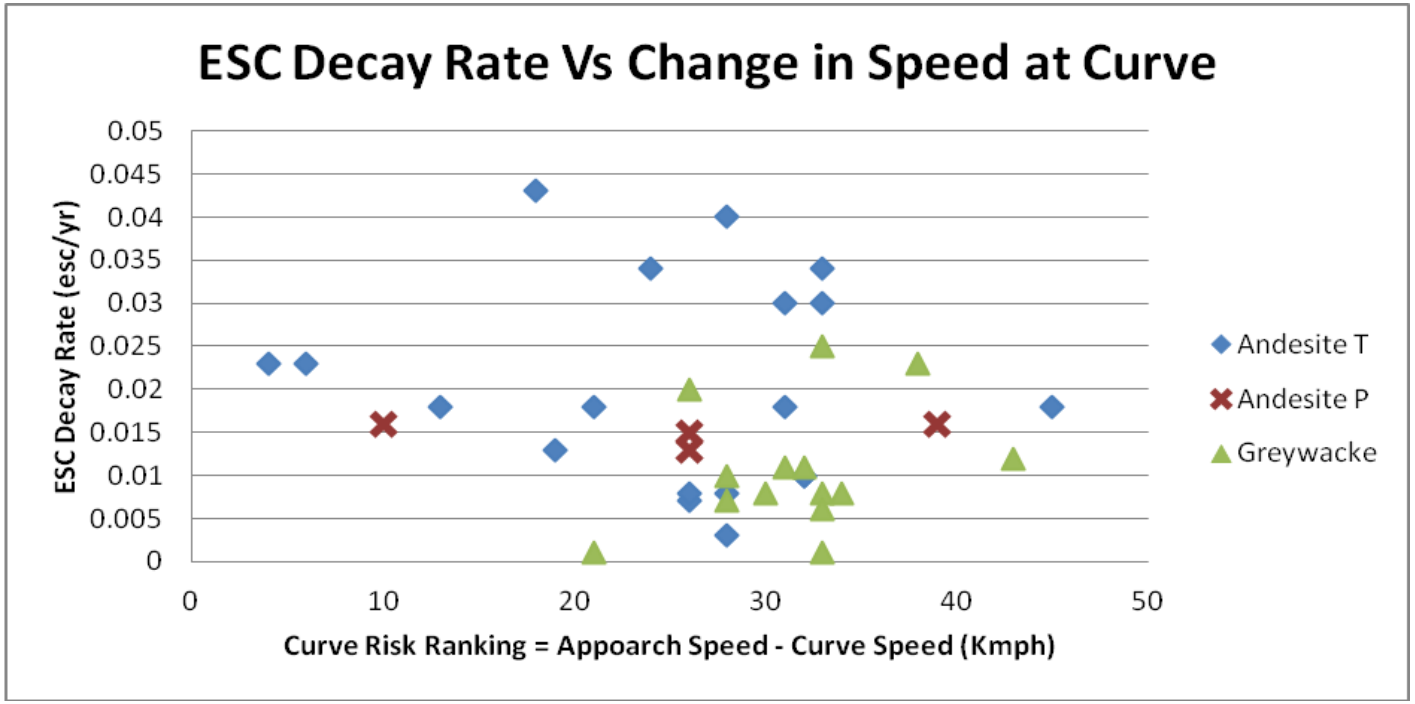
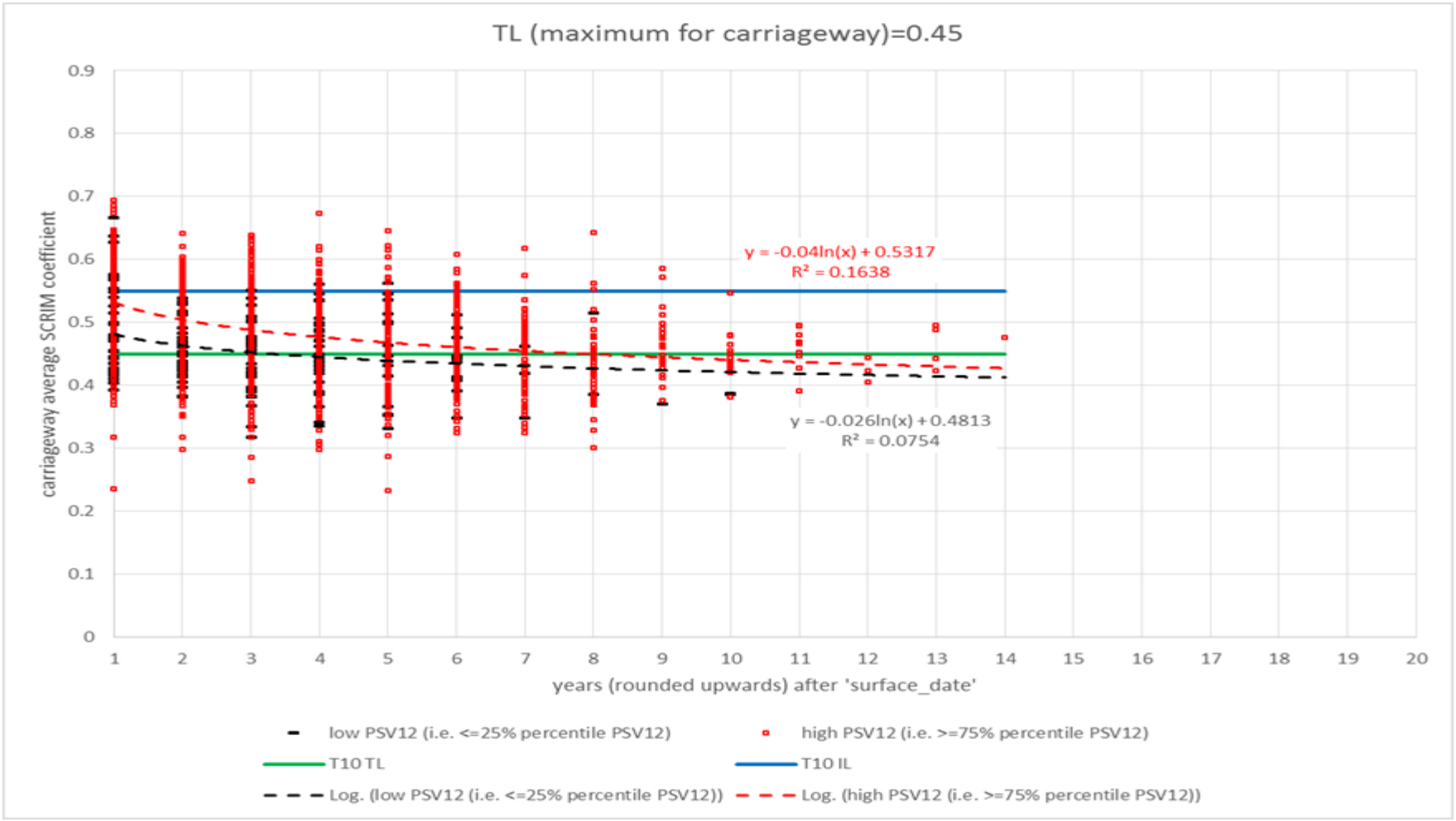


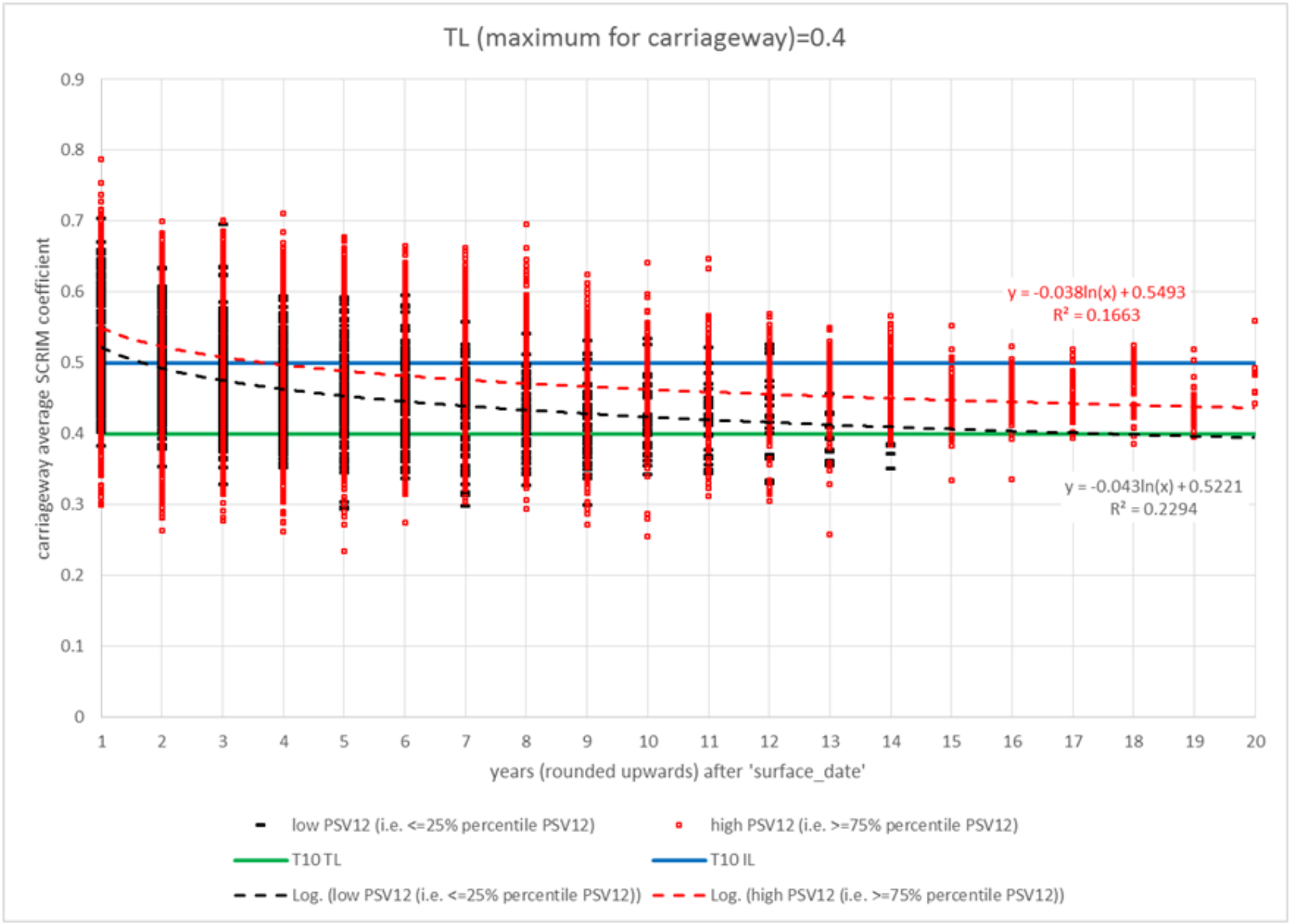
Figure 4 ESC Decay Rate Versus Approach/Design speed differential.

- No significant trend that can be derived
- 80 % of OCC checked showed some degree of on going polishing

PSV 12 V Onsite Performance

- PSV 12 results have closer correlation ESC required by site category




TL (maximum for carriageway)=0.4
carriageway average SCRIM coefficient
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
years (rounded upwards) after 'surface_date'
y = -0.038ln(x) + 0.5493
R² = 0.1663
y = -0.043ln(x) + 0.5221
R² = 0.2294
low PSV12 (i.e. <=25% percentile PSV12)
high PSV12 (i.e. >=75% percentile PSV12)
T10 TL
T10 IL
Log. (low PSV12 (i.e. <=25% percentile PSV12))
Log. (high PSV12 (i.e. >=75% percentile PSV12))

Bad Friction Plot

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Contact details
terry.boyle@nzta.govt.nz
0064 027 210 1719


The Right Track


THANK YOU