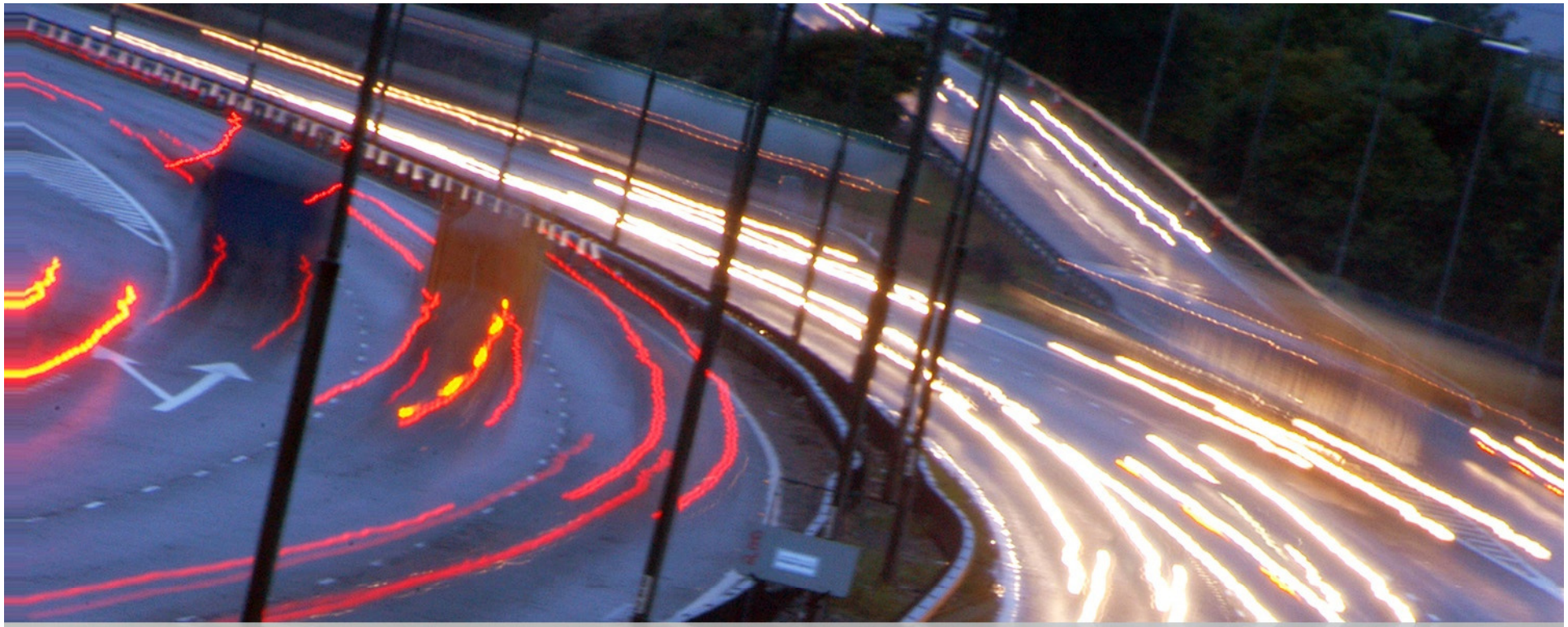


High speed friction of thin surface course systems

Alan Dunford

21st May 2014

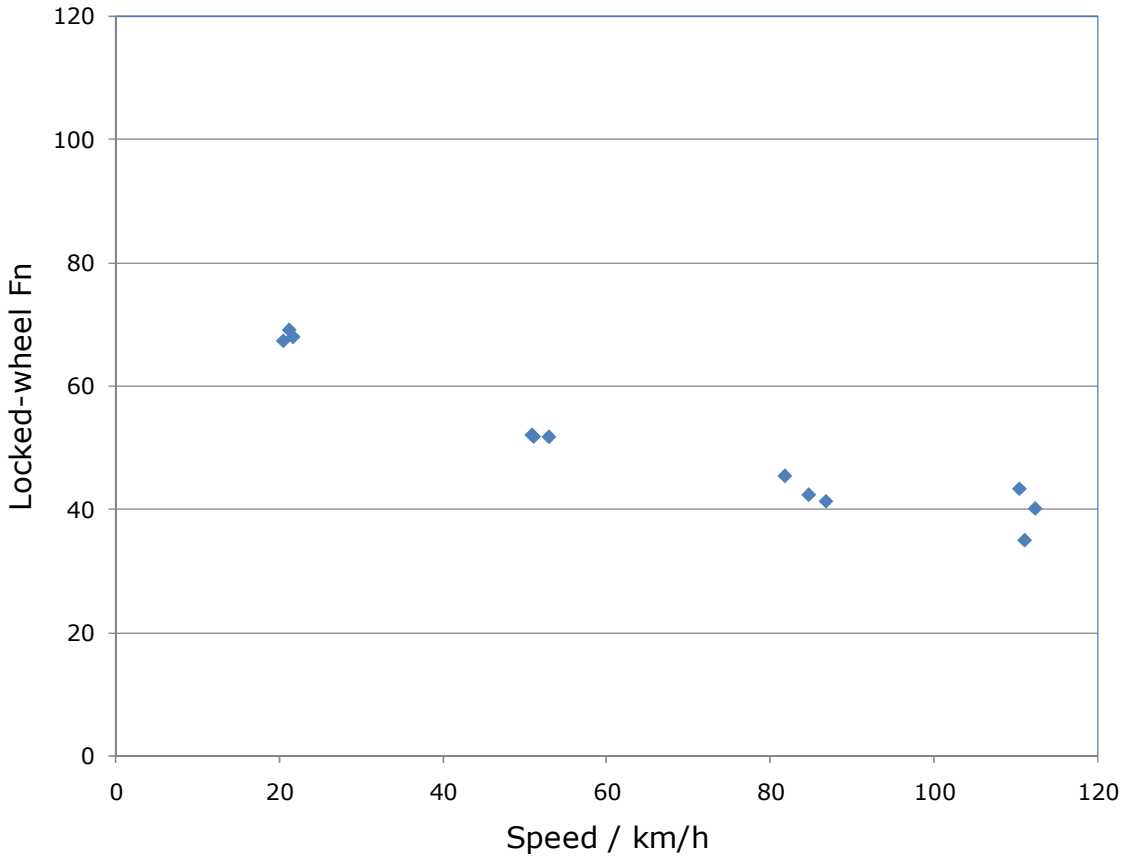
High speed friction measurement

Pavement Friction Tester

- Locked wheel
- Spot measurements
- Range of speeds
- Research tool rather than routine monitoring

High speed friction measurement

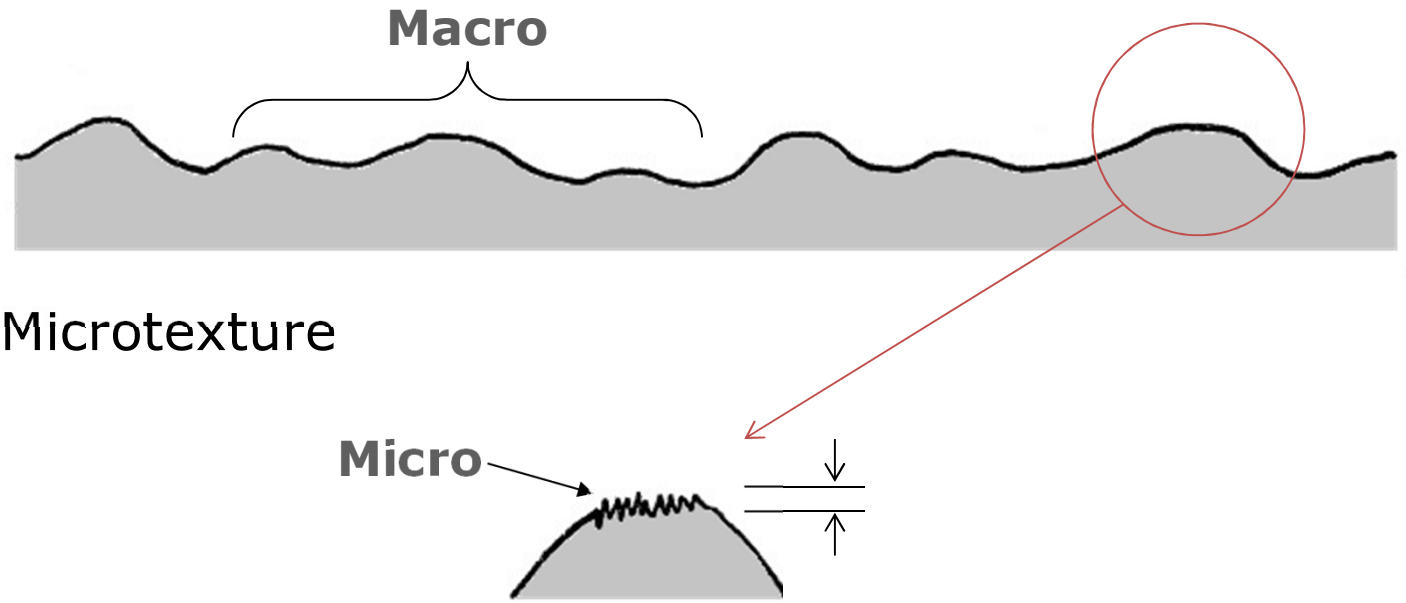
PFT measurements



Example on A5 Gibbet Hill, Lane 1, 10mm section (August '09)

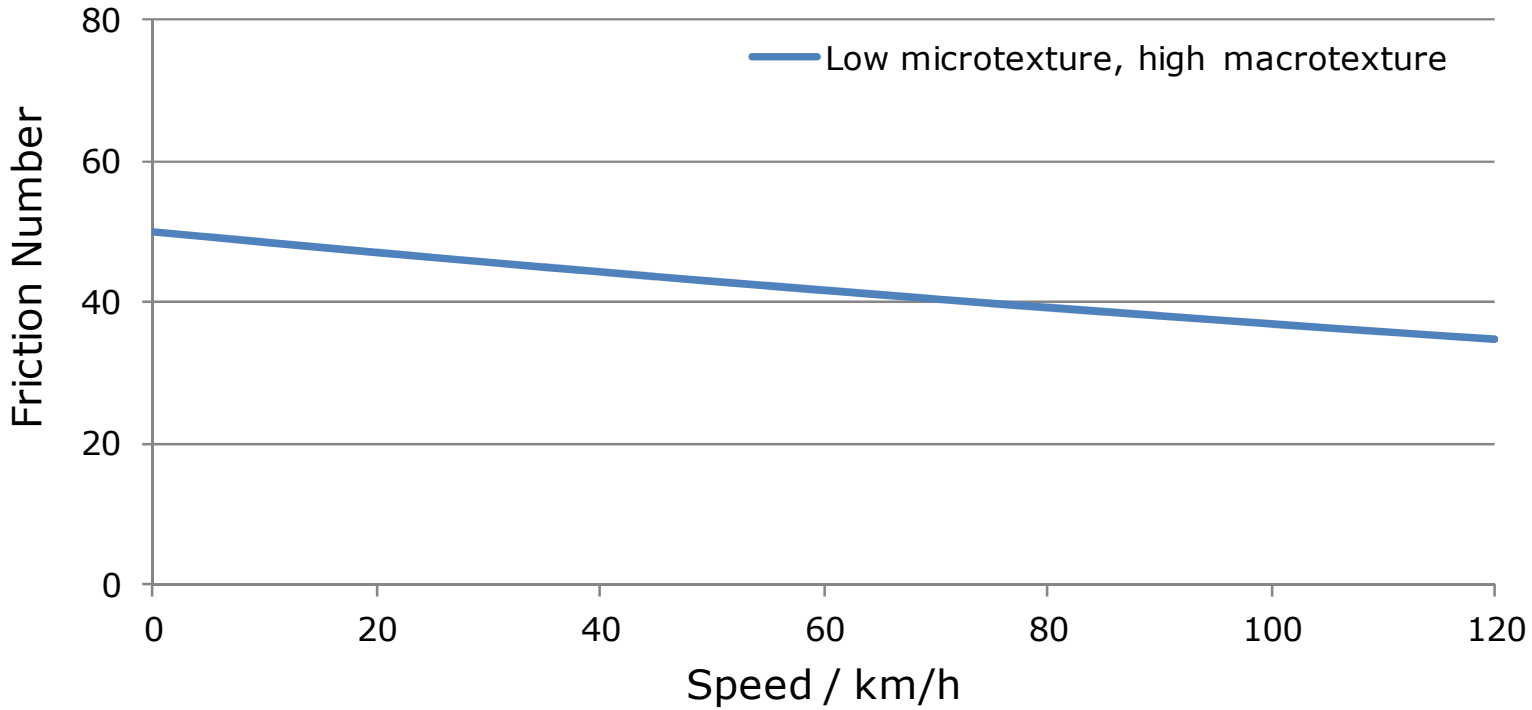
Theory – texture scales

- Two scales of texture
  - Macrotexture / texture depth

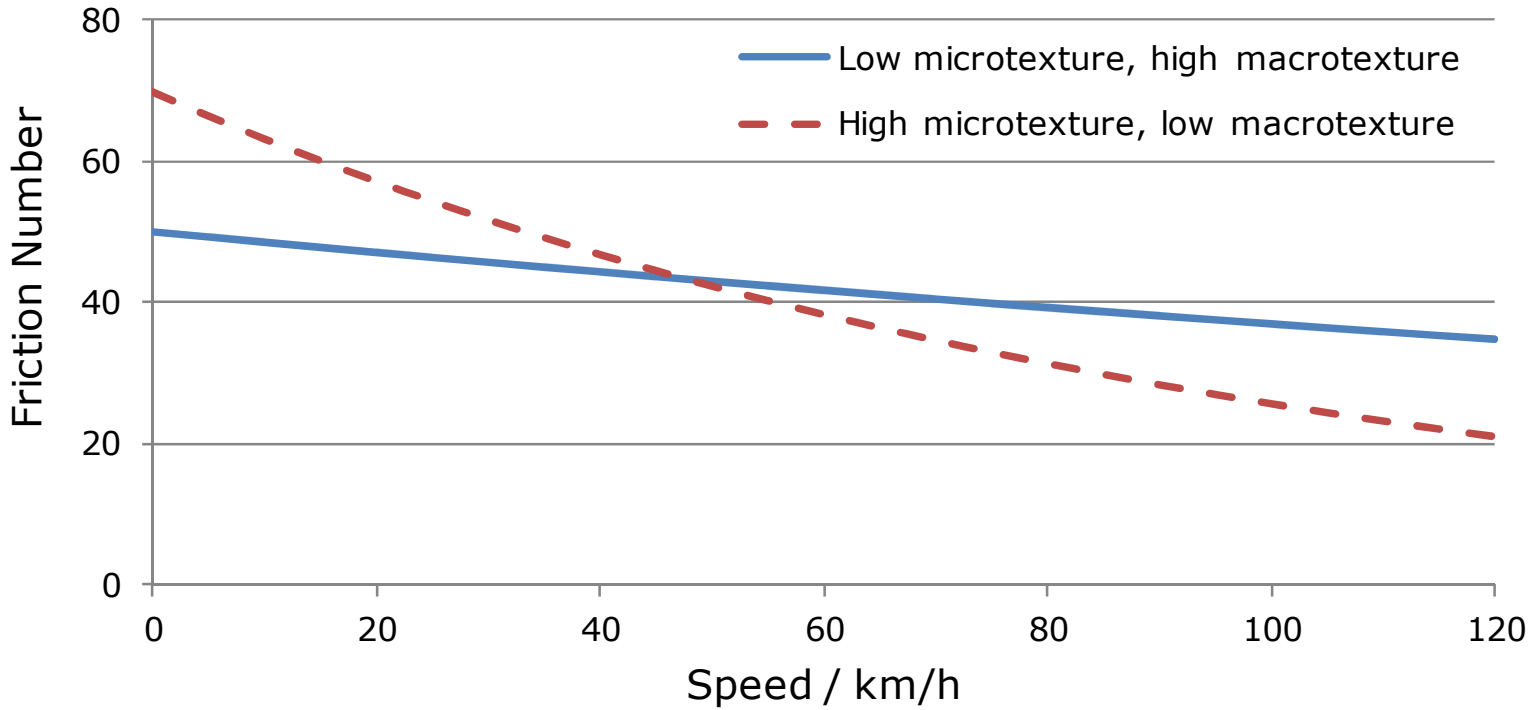


  - Microtexture

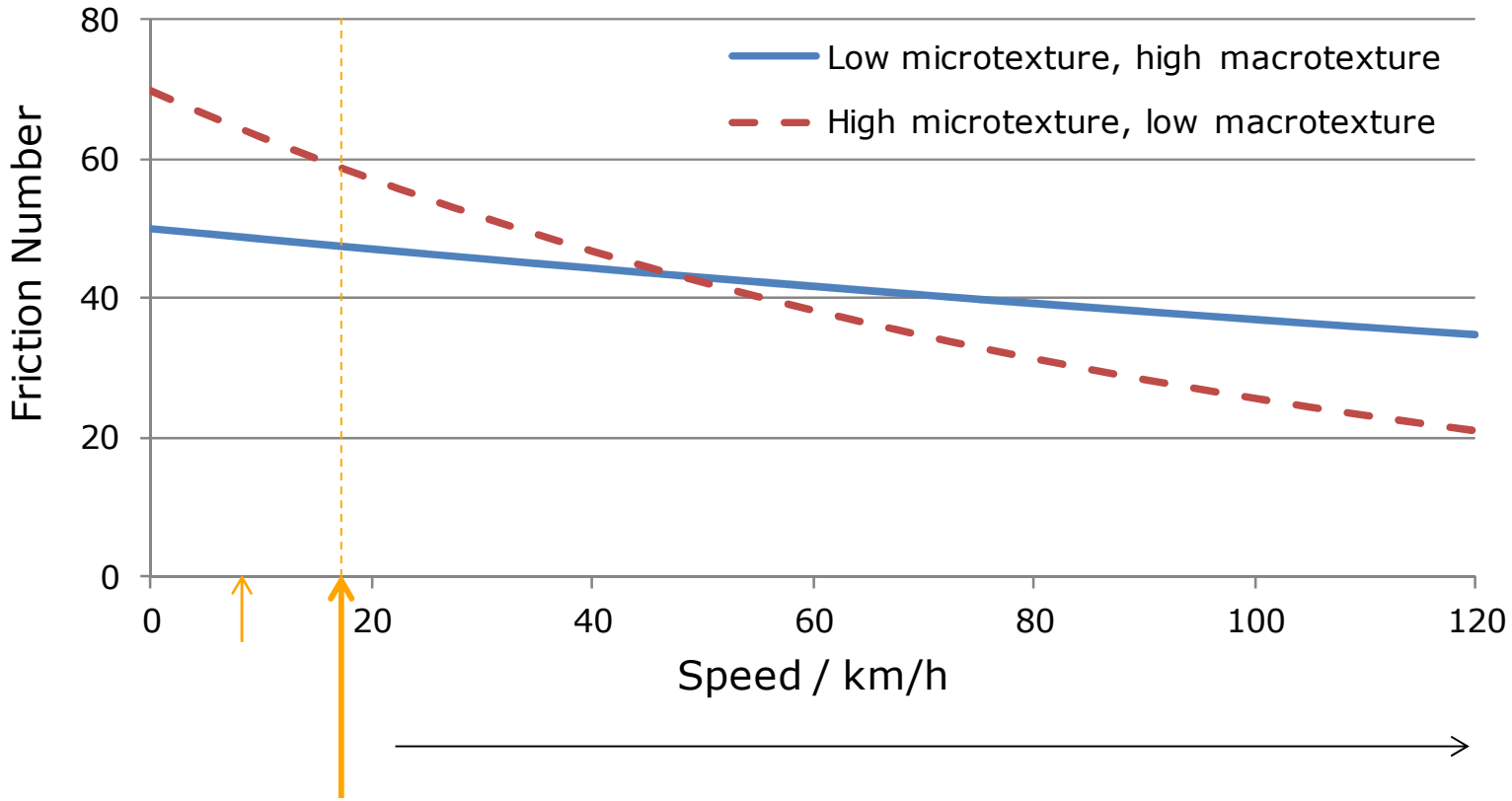
Theory – texture and skid resistance



Theory – texture and skid resistance

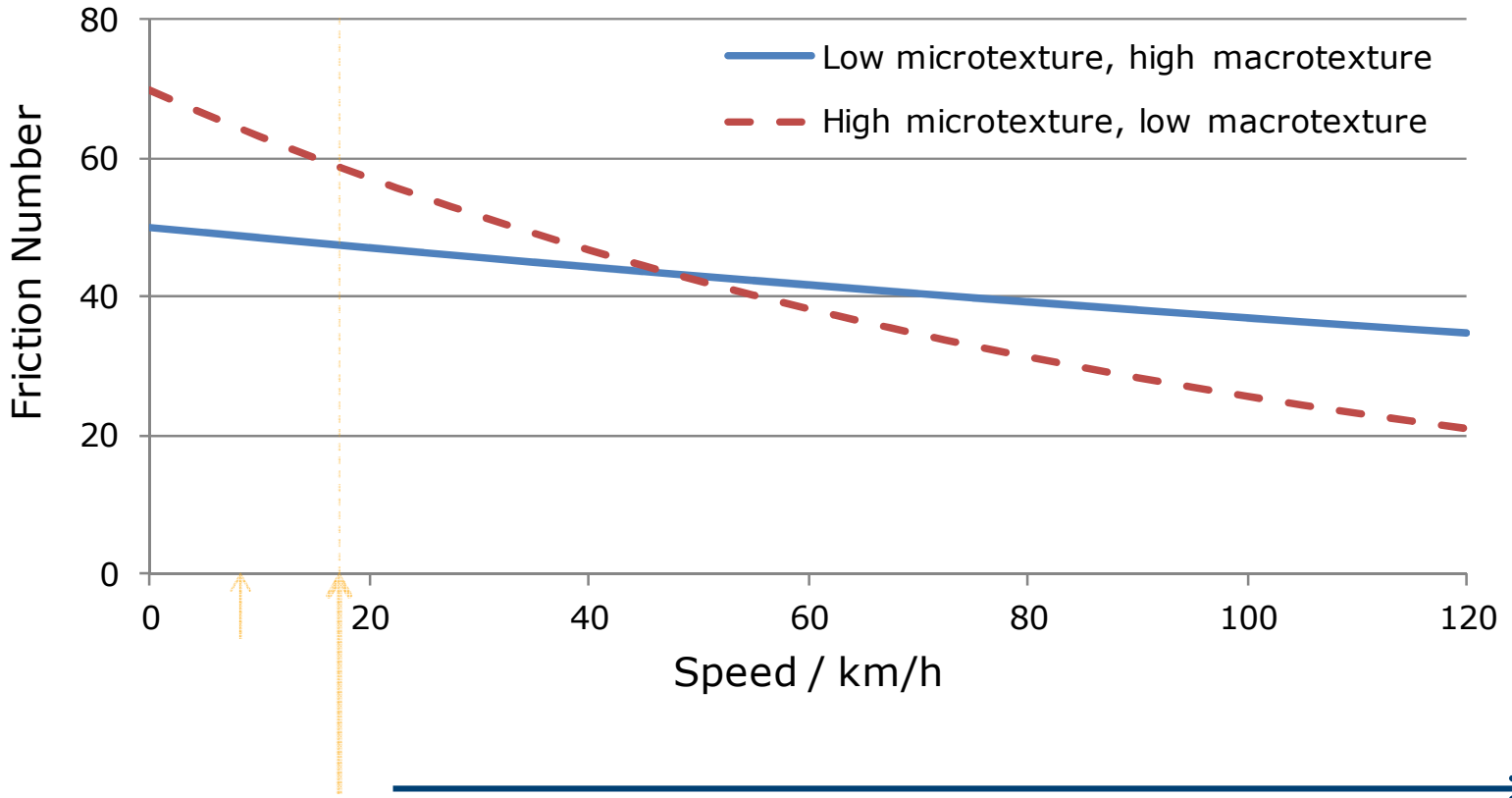


Theory – texture and skid resistance



Measure low speed friction
with SCRIM (or GripTester)

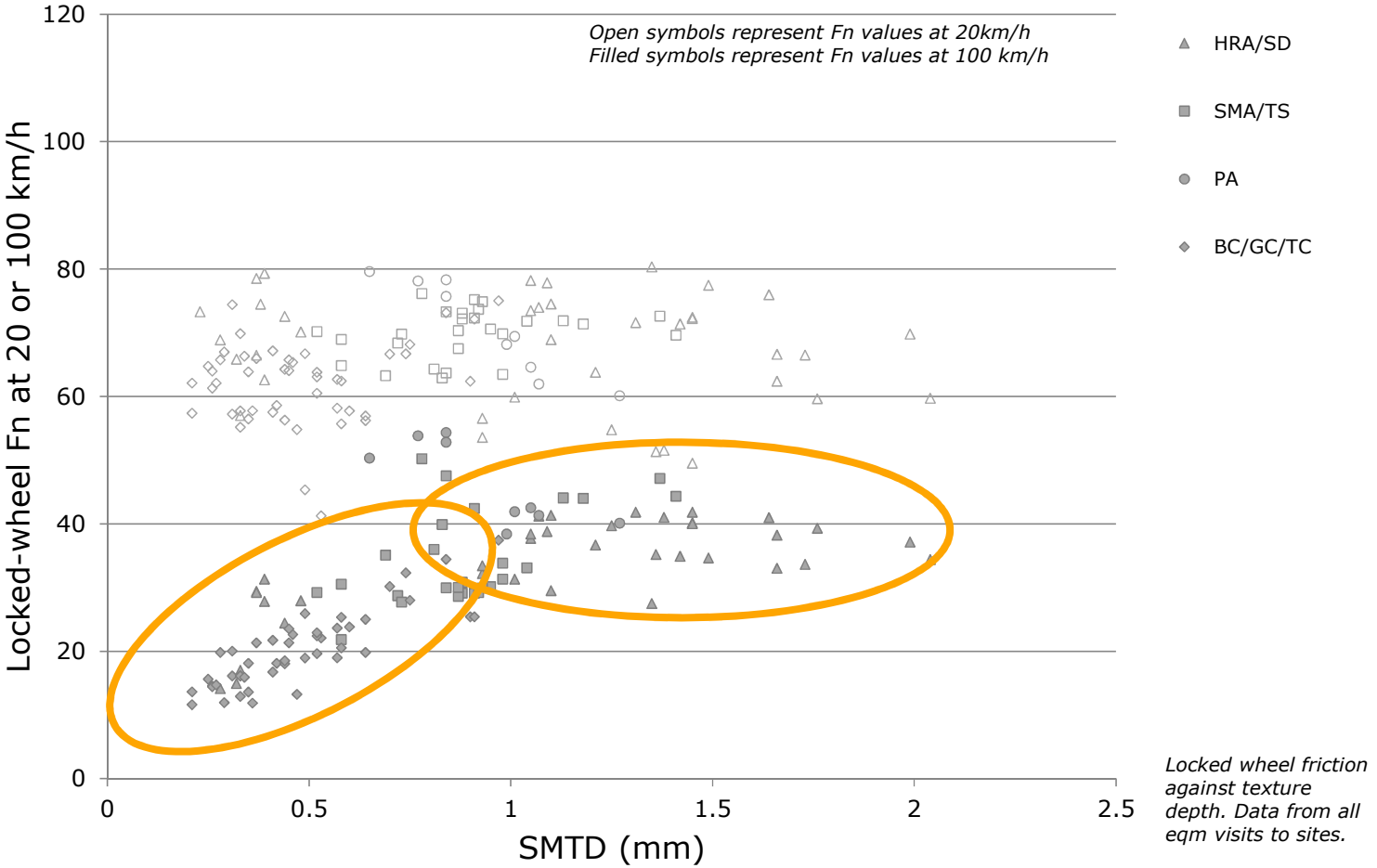
Theory – texture and skid resistance



High speed friction not routinely measured –
Use texture as a surrogate

High speed friction and texture

Texture, friction and speed – TRL367



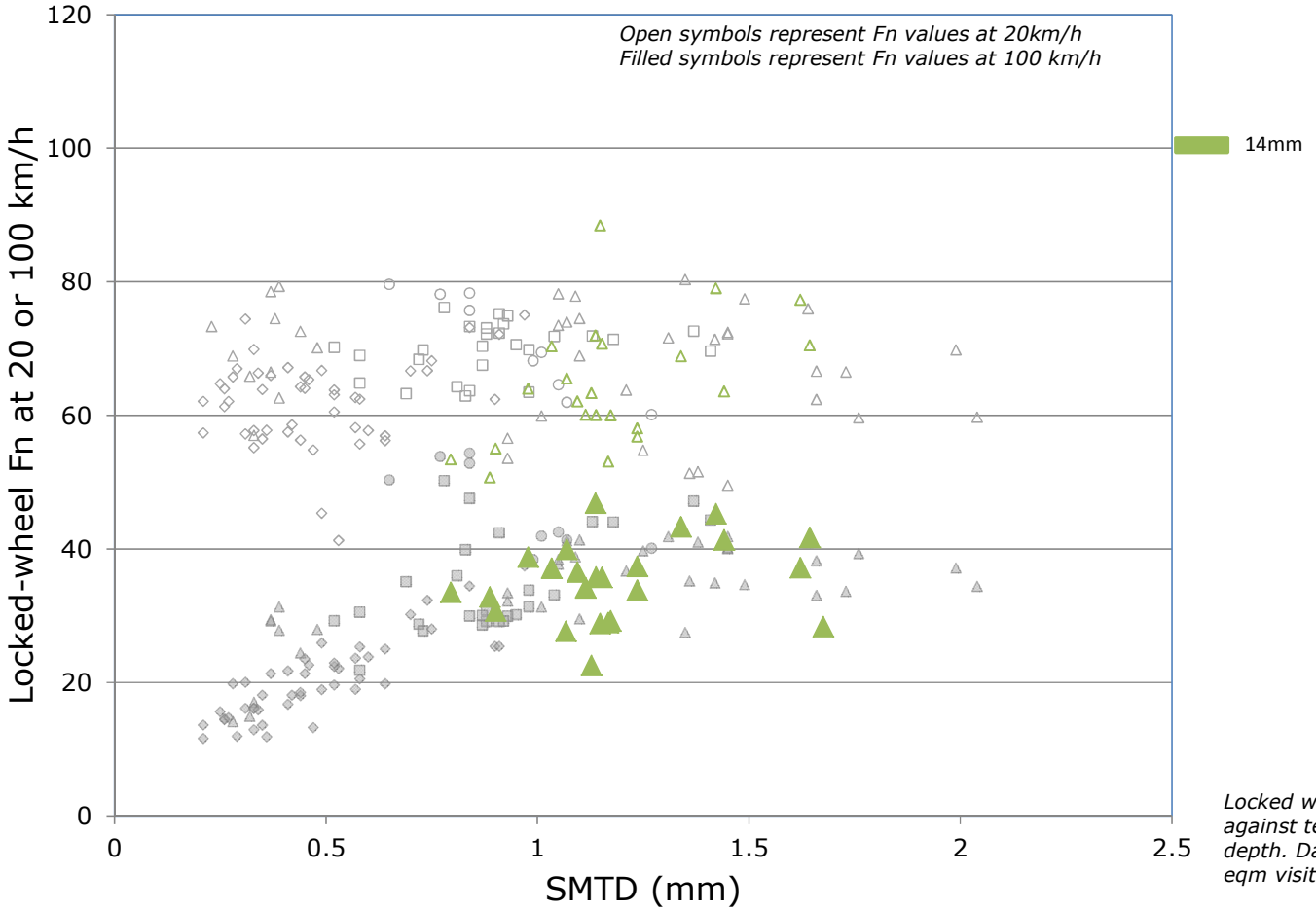
Locked wheel friction against texture depth. Data from all eqm visits to sites.

High speed friction and low texture

- Collaborative programme 2008 – 2011
- Thin surface course systems with different coarse aggregate
  - 0/14 mm
  - 0/10 mm
  - 0/6 mm

High speed friction and low texture

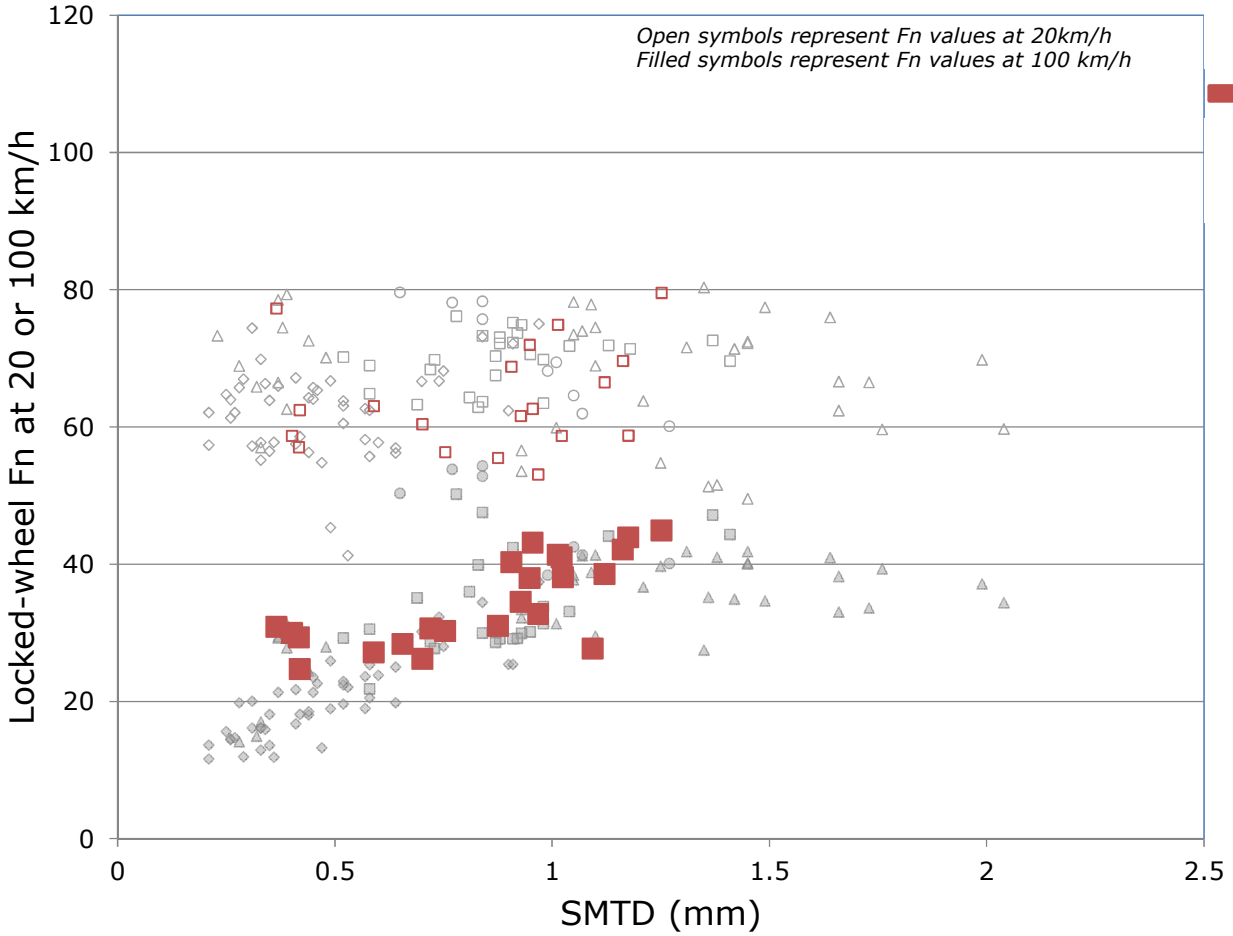
0/14mm materials broadly typical of “traditional” pattern



Locked wheel friction against texture depth. Data from all eqm visits to sites.

High speed friction and low texture

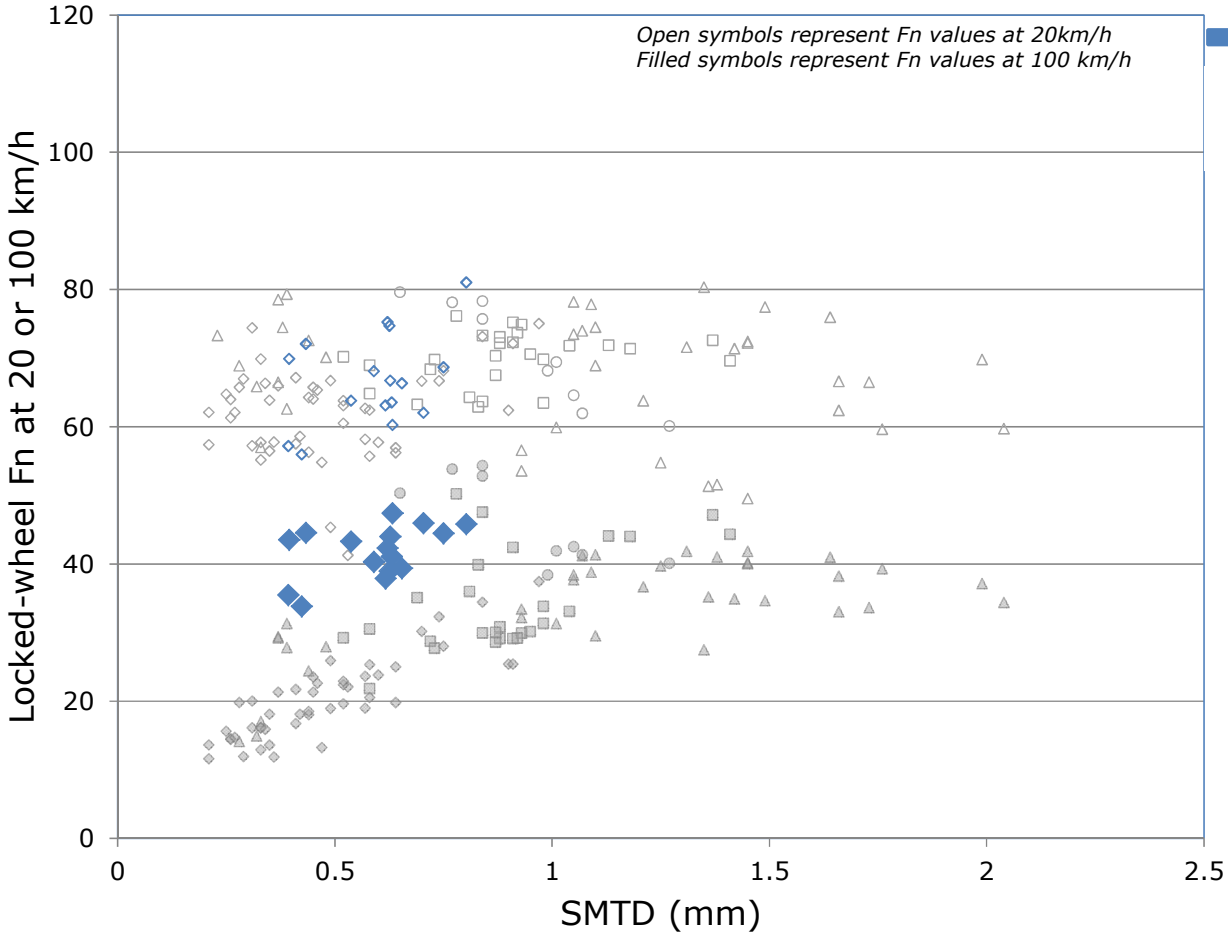
0/10mm materials broadly similar to “traditional” pattern



Locked wheel friction against texture depth. Data from all eqm visits to sites.

High speed friction and low texture

0/6mm materials performed better than expected at high speeds



Locked wheel friction against texture depth. Data from all eqm visits to sites.

Texture as a surrogate for high speed friction?

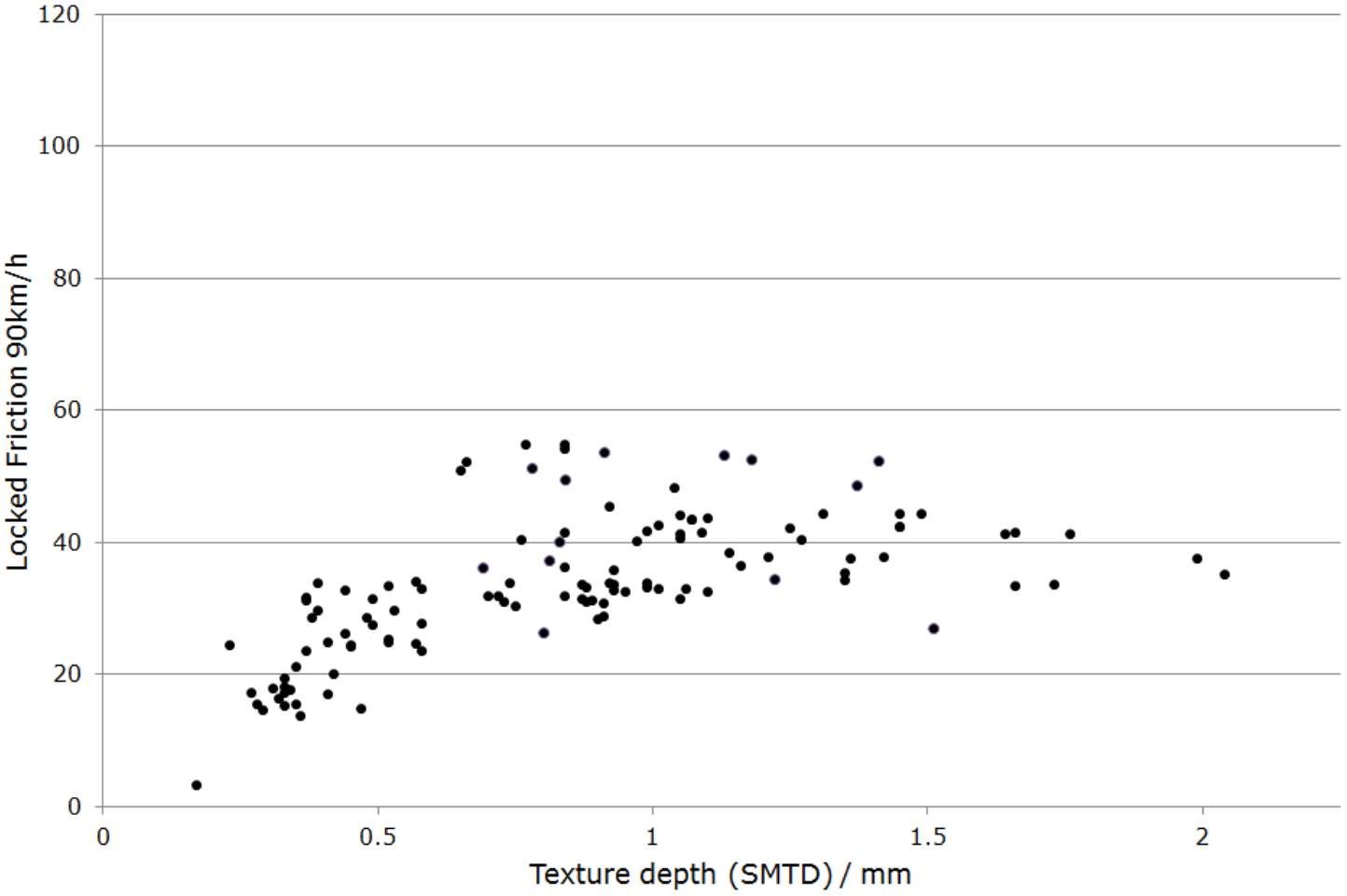
- There is no obvious explanation for the uncharacteristic behaviour of 0/6 mm materials
  - SMTD (or any) texture measurement technique may not adequately characterise the road surface
  - Smaller-sized particles lead to a different pressure distribution in the contact patch, also affecting the way in which the tyre and road interact
  - Different contact areas or pressure distributions affect the polishing mechanism and the equilibrium skid resistance developed

Texture as a surrogate for high speed friction?

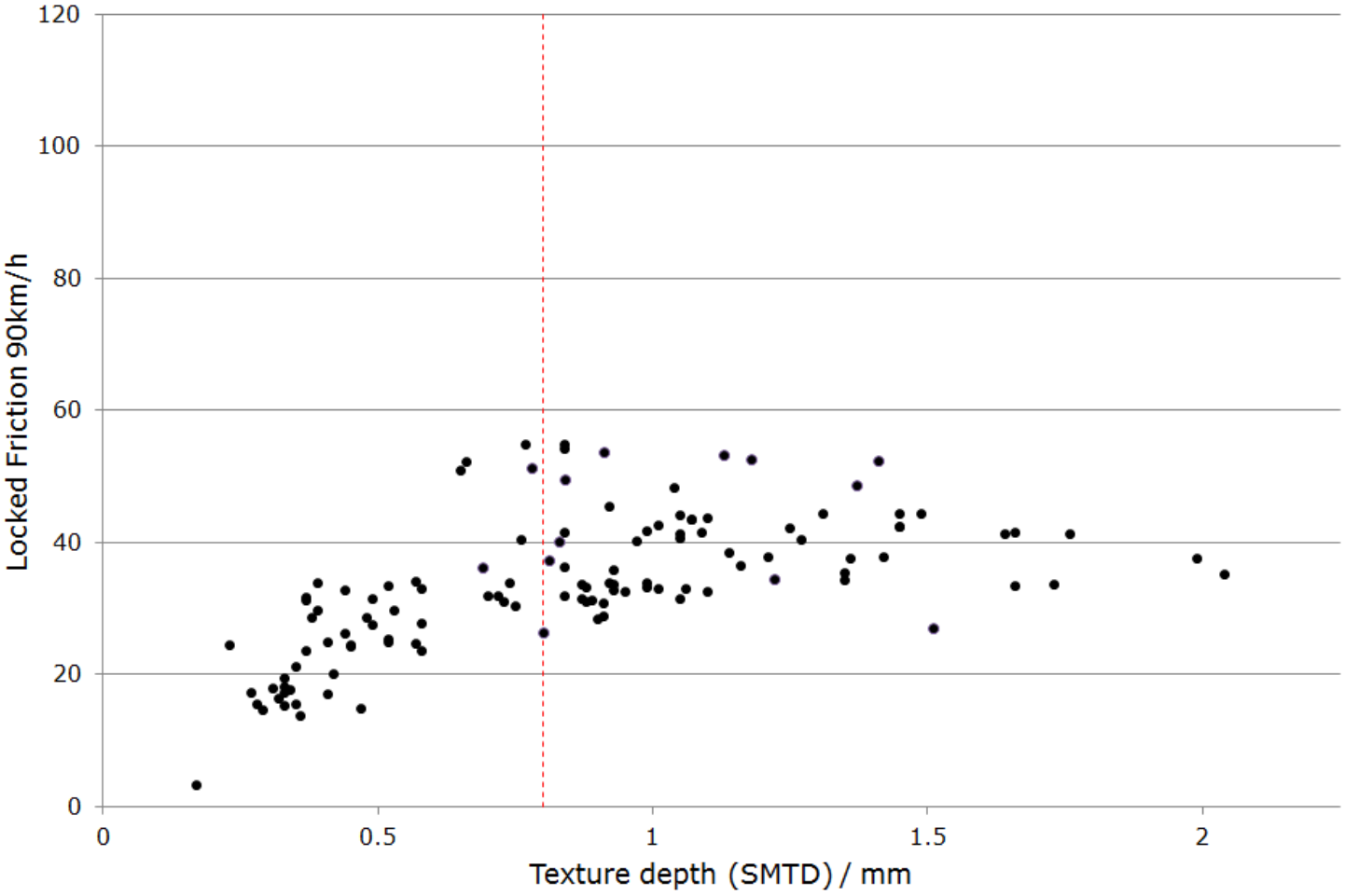
- Texture depth on 0/6mm surfacings lower than normally accepted but good performance at high speed
- So IAN 154/12 relaxes texture requirements for hot applied cl.942 thin surface course systems
  - 0.9 mm MTD initial, 0.7mm MTD retained
- With an additional requirement for verification of high speed friction performance

- So need to develop a high speed friction criterion
- In principle, applicable to any surfacing

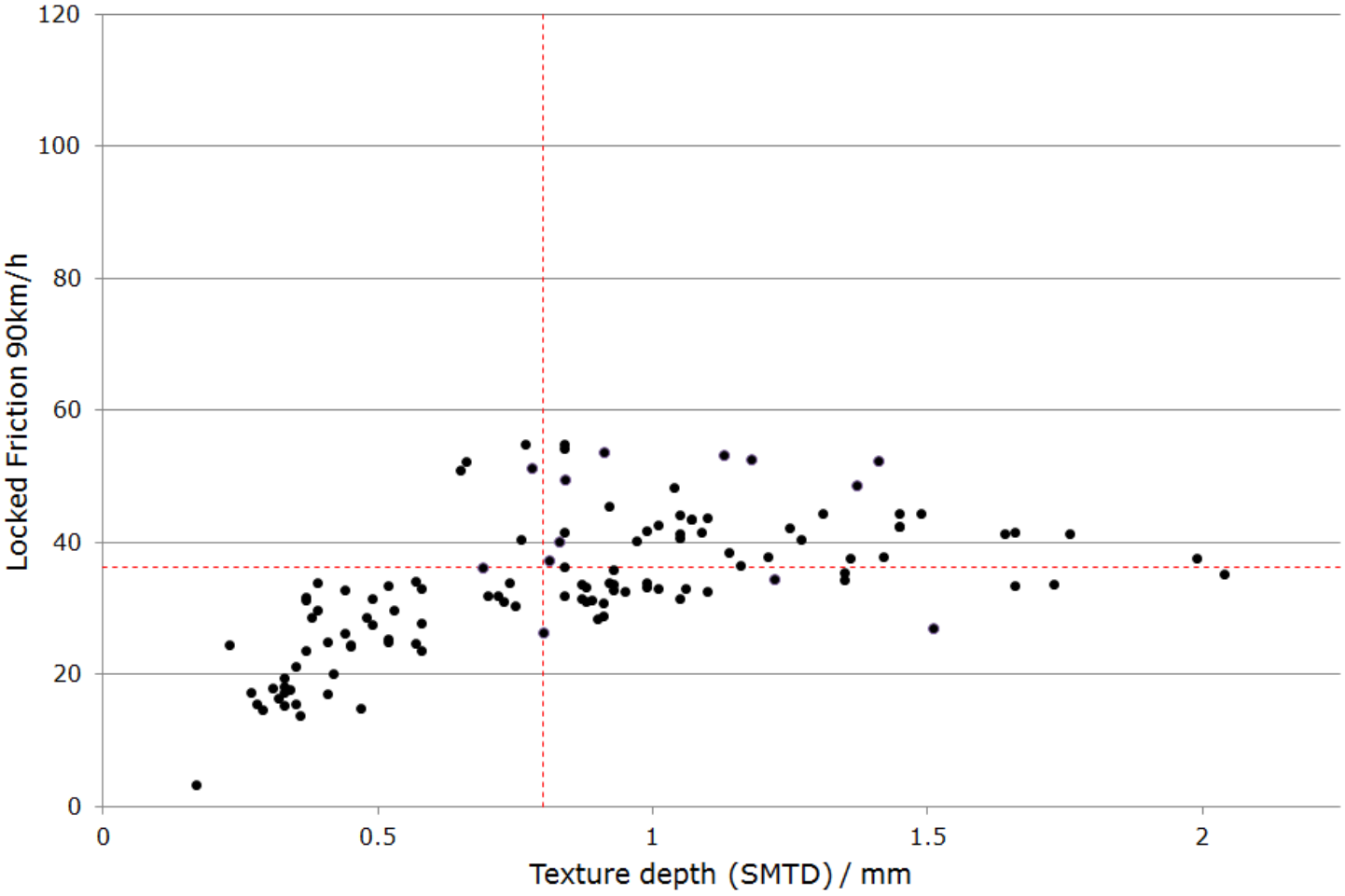
High speed friction criterion



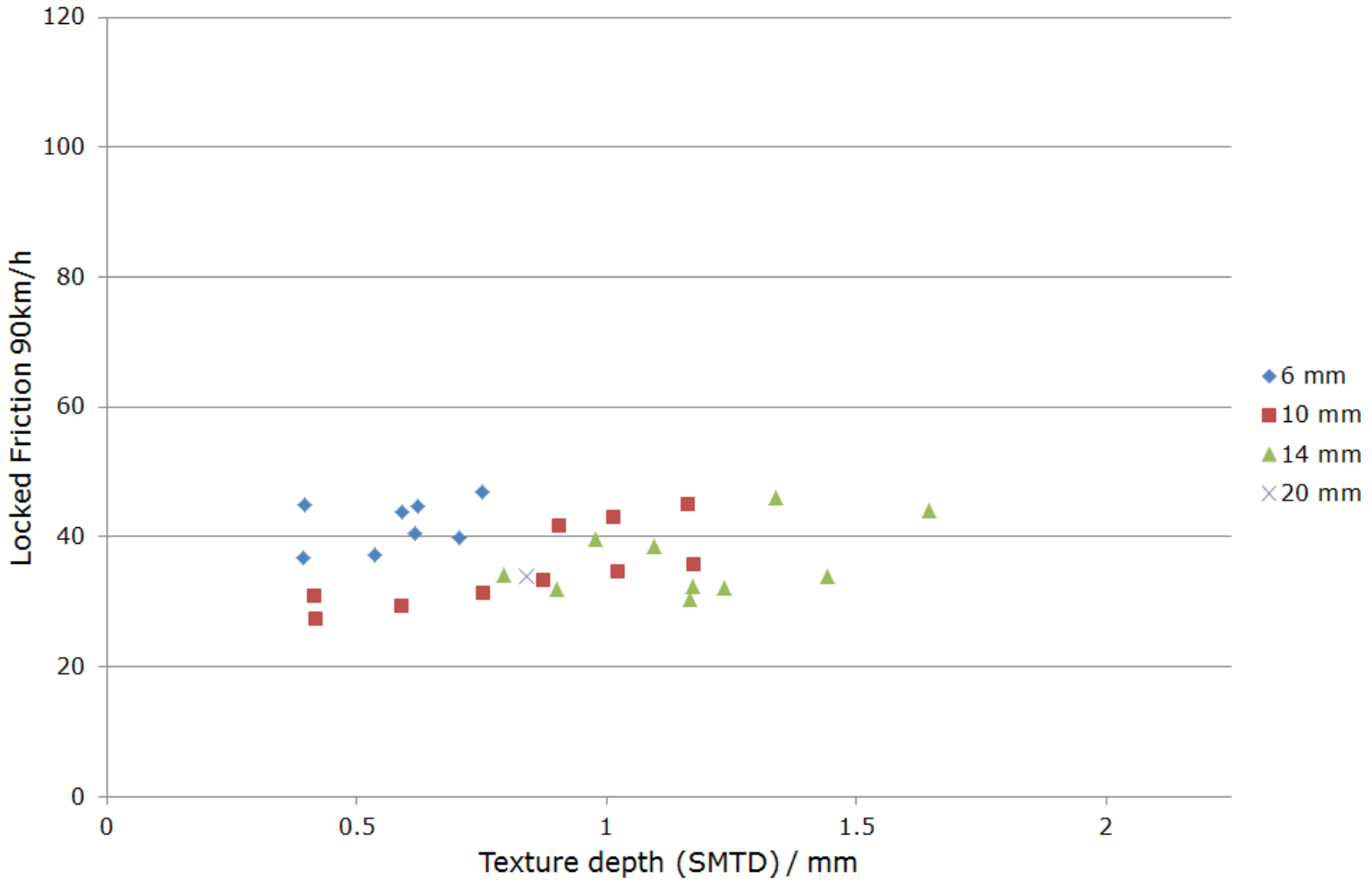
High speed friction criterion



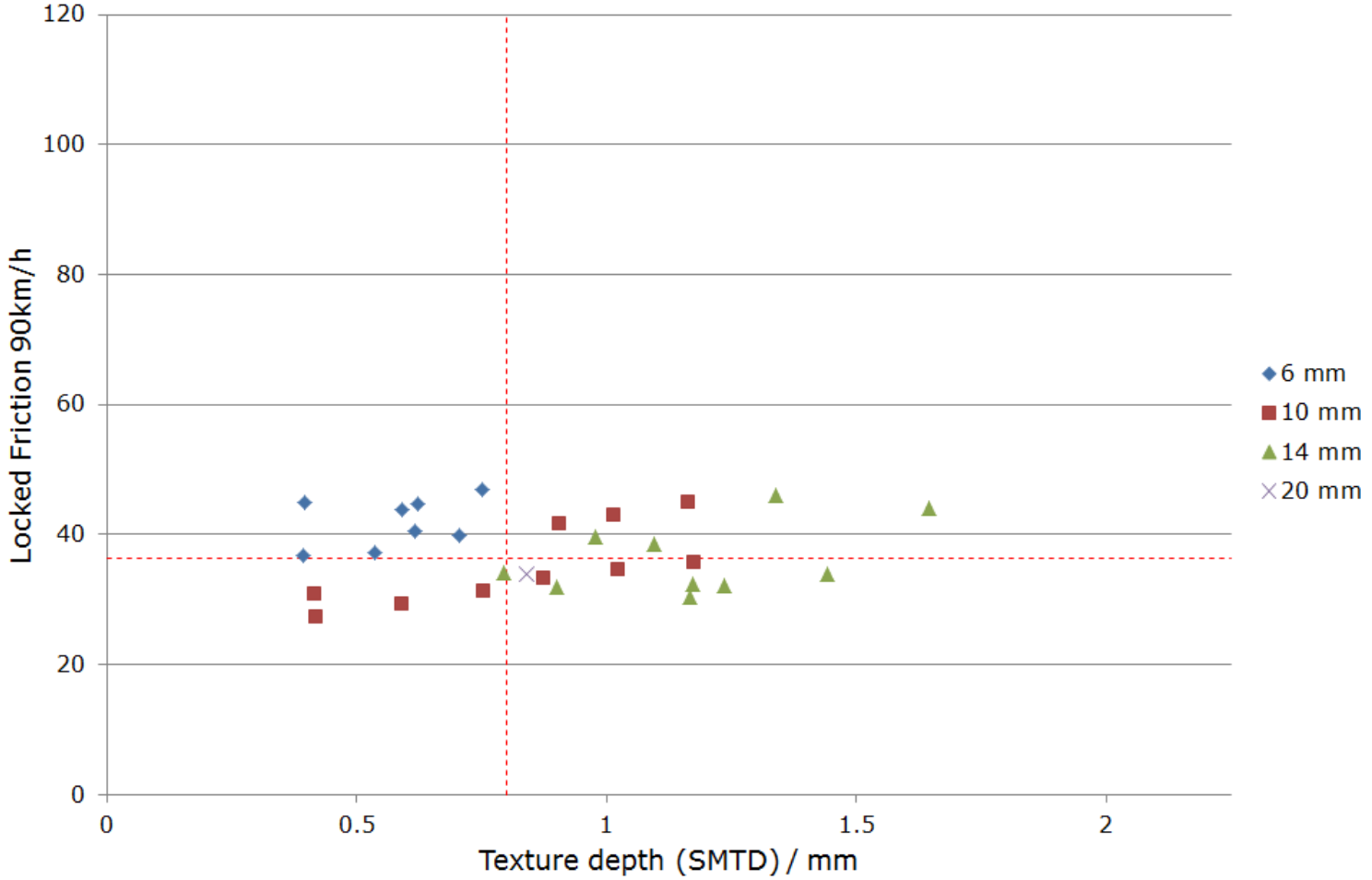
High speed friction criterion



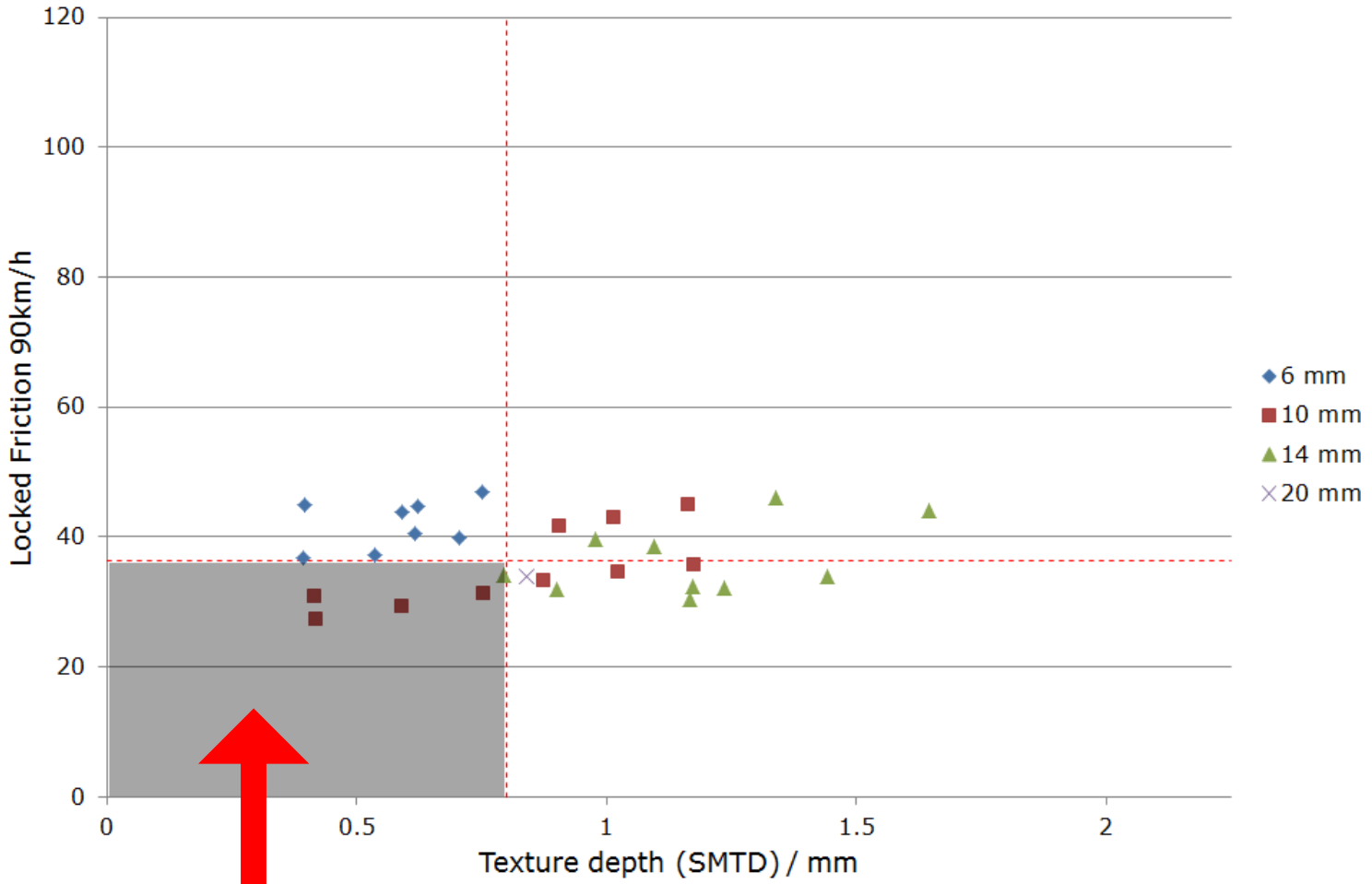
High speed friction criterion



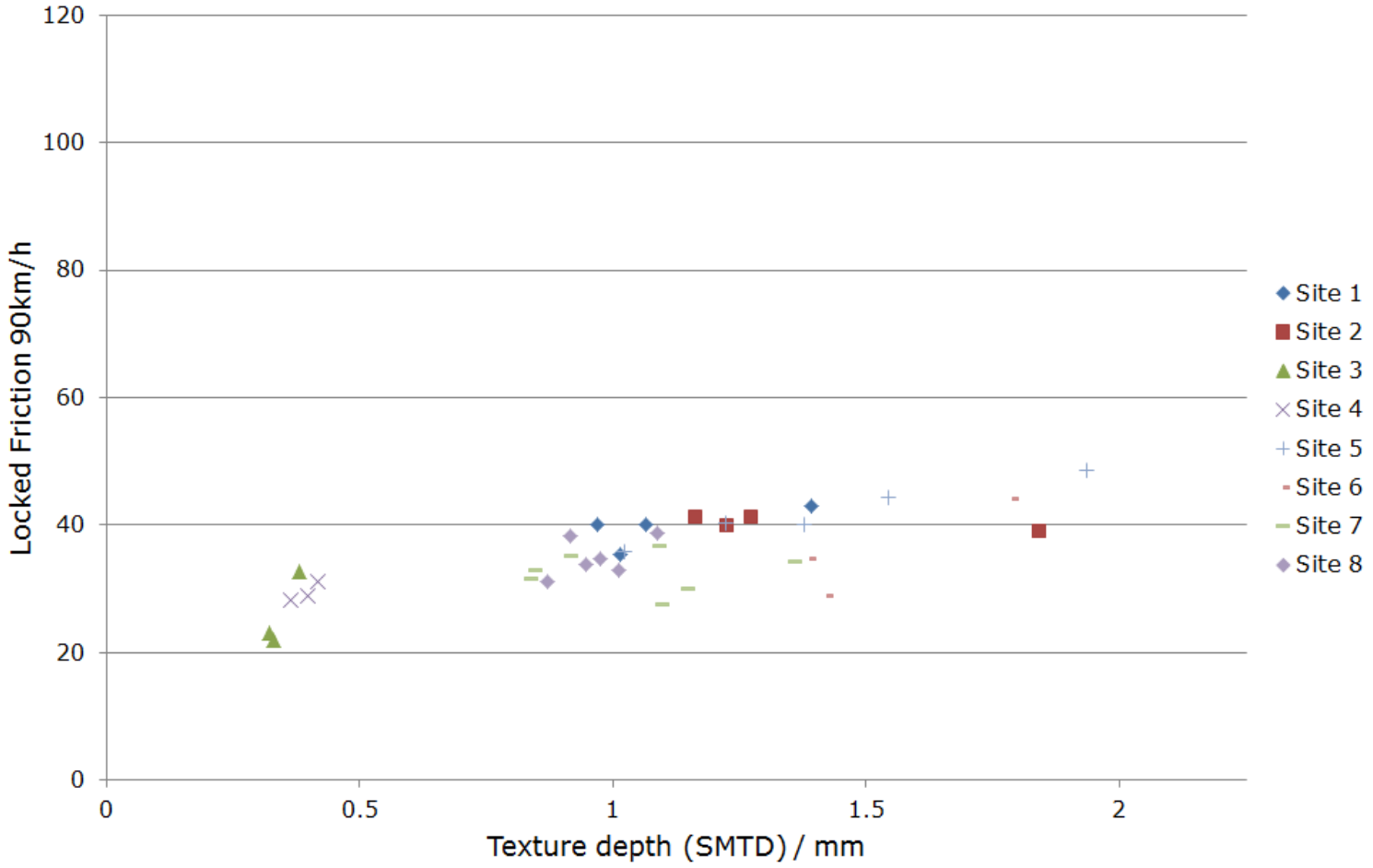
High speed friction criterion



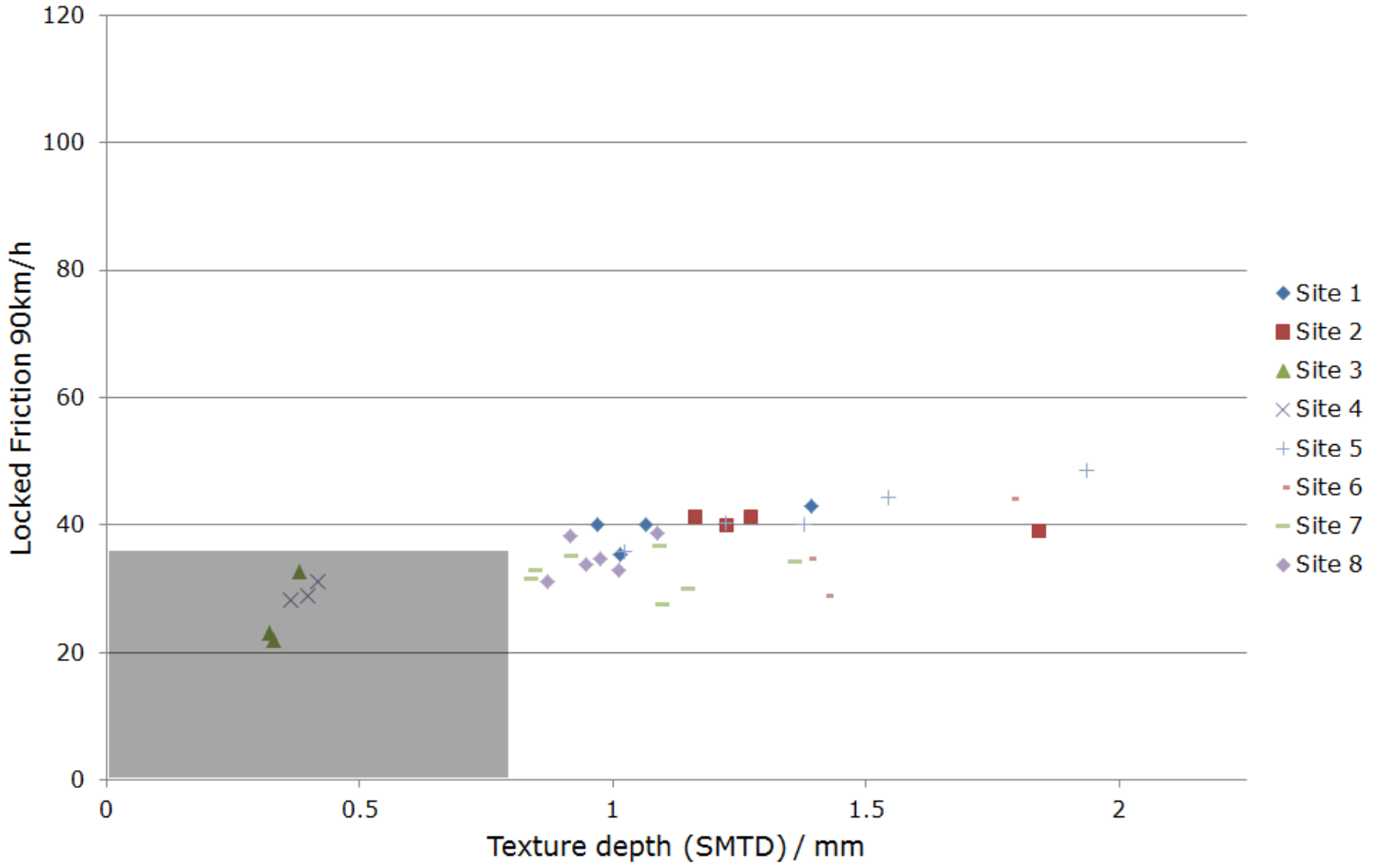
High speed friction criterion



High speed friction criterion



High speed friction criterion



High speed friction criterion

- Additional requirement for standard deviation between results to ensure consistent surface
- Peak friction criterion also suggested, but needs development
- A surface not meeting the criterion should be investigated
- In principle, any low textured surface could be permitted if it passes the high speed friction criterion

Thank you

High speed friction of thin surface course systems

Alan Dunford
21st May 2014
adunford@trl.co.uk

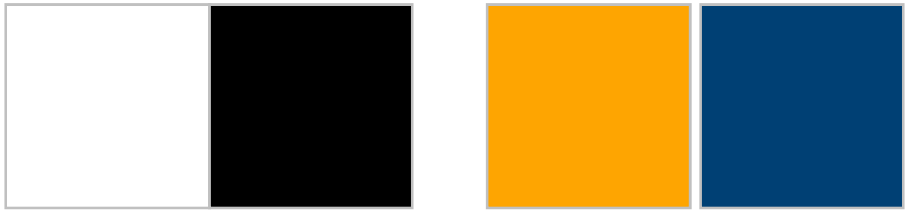
Thank you

High speed friction of thin surface course systems

Alan Dunford
21st May 2014
adunford@trl.co.uk

TRL color palette

Main TRL PowerPoint colour swatches



Additional colors: gray scale

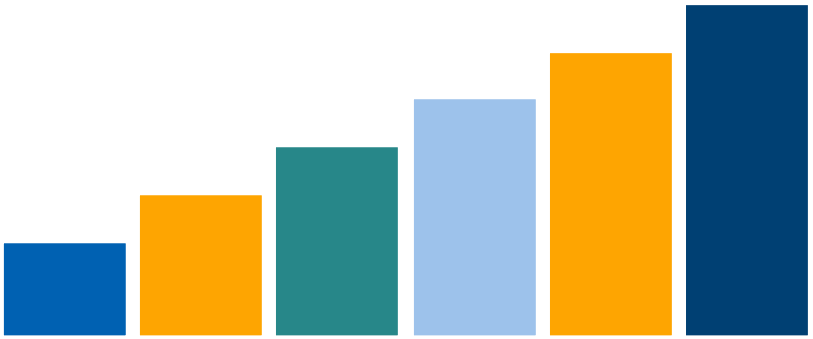


Diagram colors