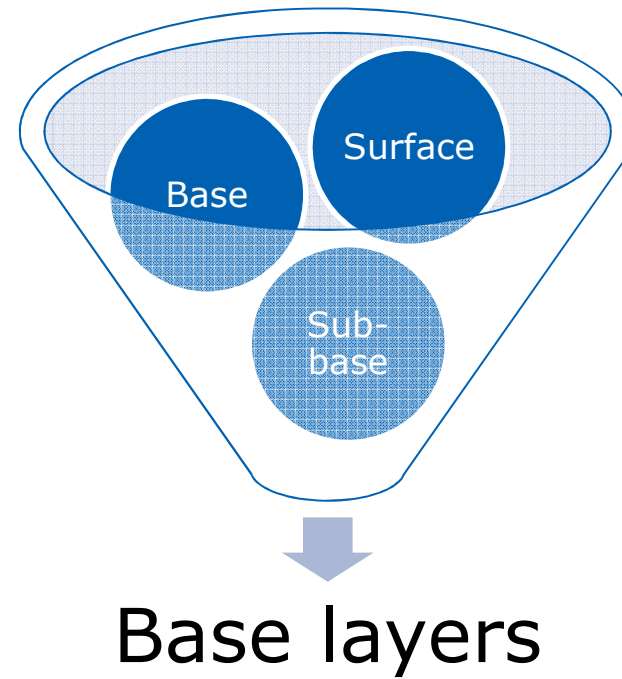# Use of reclaimed asphalt in the surface course – the effect on friction

Alan Dunford
20th May 2014
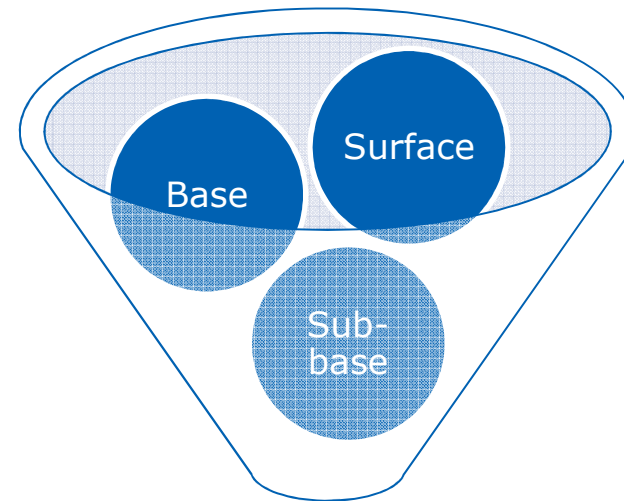
Use of reclaimed asphalt
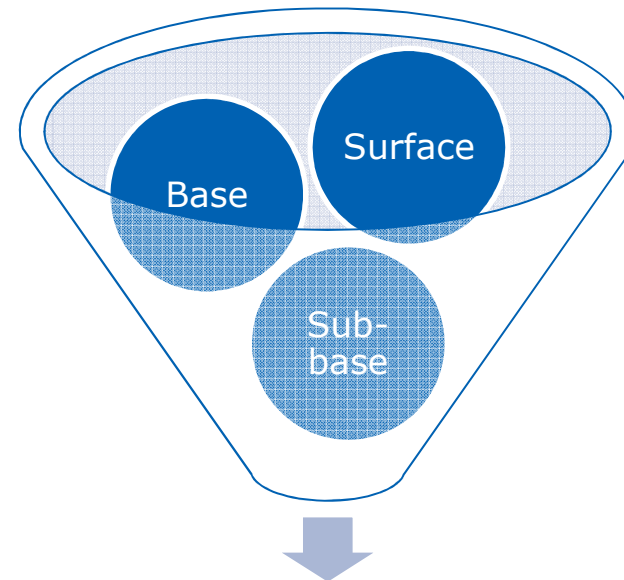

Base layers

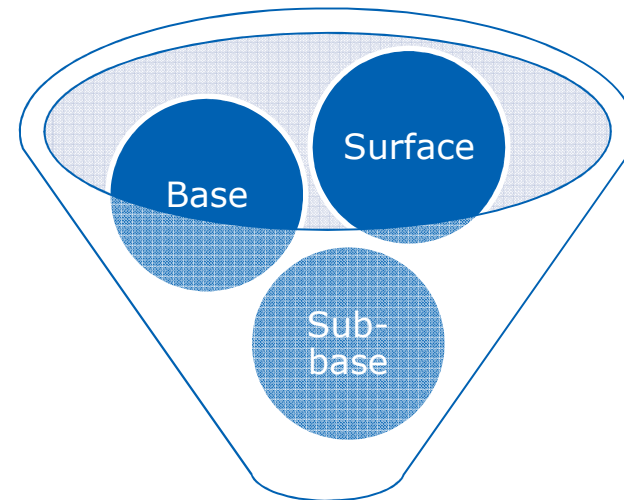# Use of reclaimed asphalt

Base layers

Use of reclaimed asphalt

Surface course

Use of reclaimed asphalt

Base · Surface · Sub-base

Surface course

?

Reclaimed asphalt – current practice

- Various reclaimed asphalt stockpiles
  (200 tonnes to 15,000 tonnes)

- Not generally separated by source

- Some petrographic classification
  - Not possible, or difficult to carry out normal lab tests (e.g. PSV)

- Currently used in small quantities in the surface course
  (5% to 10%)

- Road Note 43 suggests incorporation up to 30% is feasible
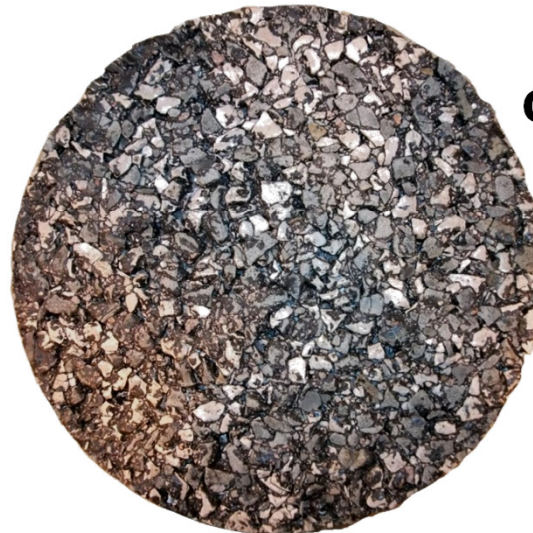
Principle - mixing coarse aggregate

Coarse aggregate A

$\mu = a$
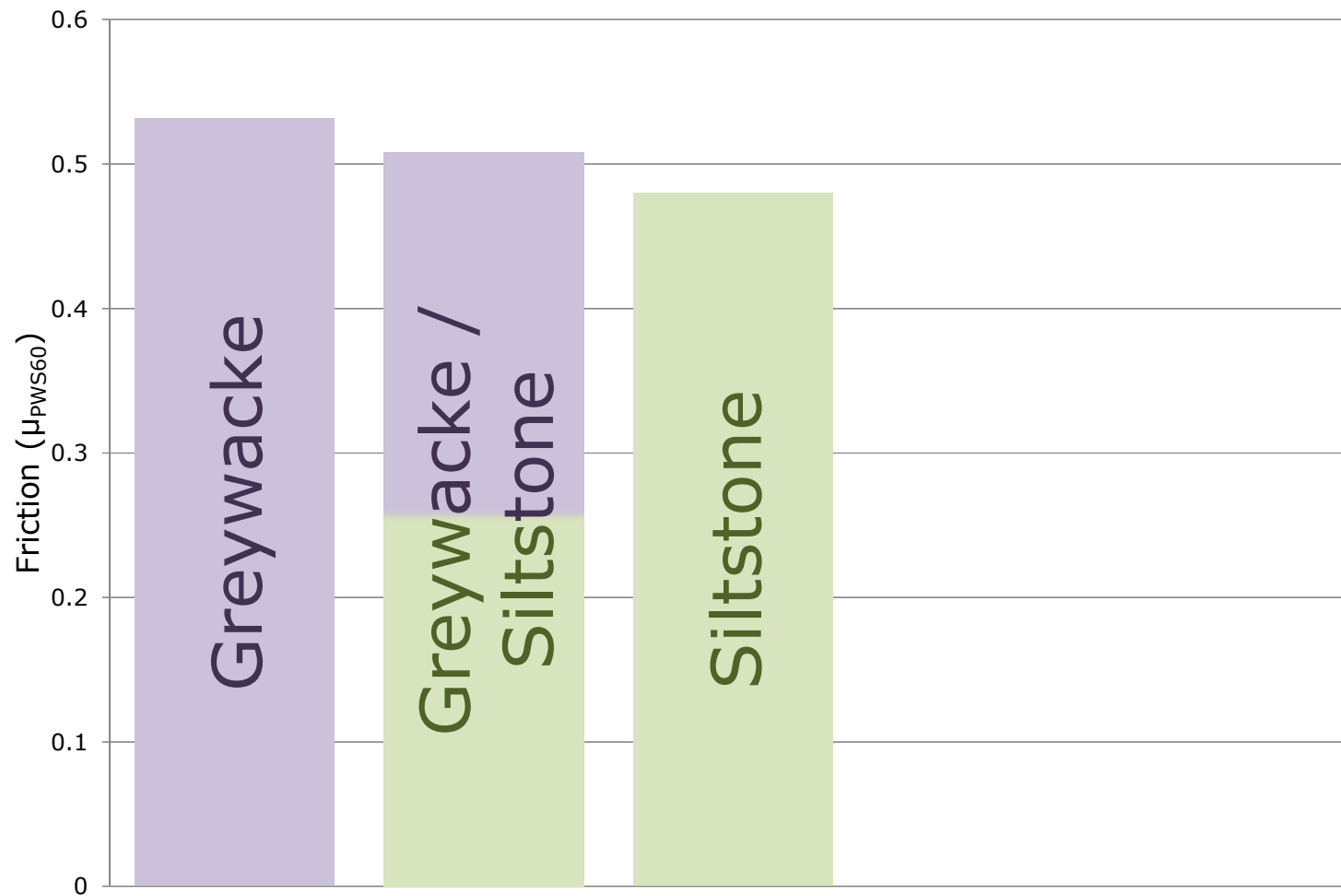
Coarse aggregate B

$\mu = b$

Coarse aggregates A and B

$\mu = a/2 + b/2 \ ?$

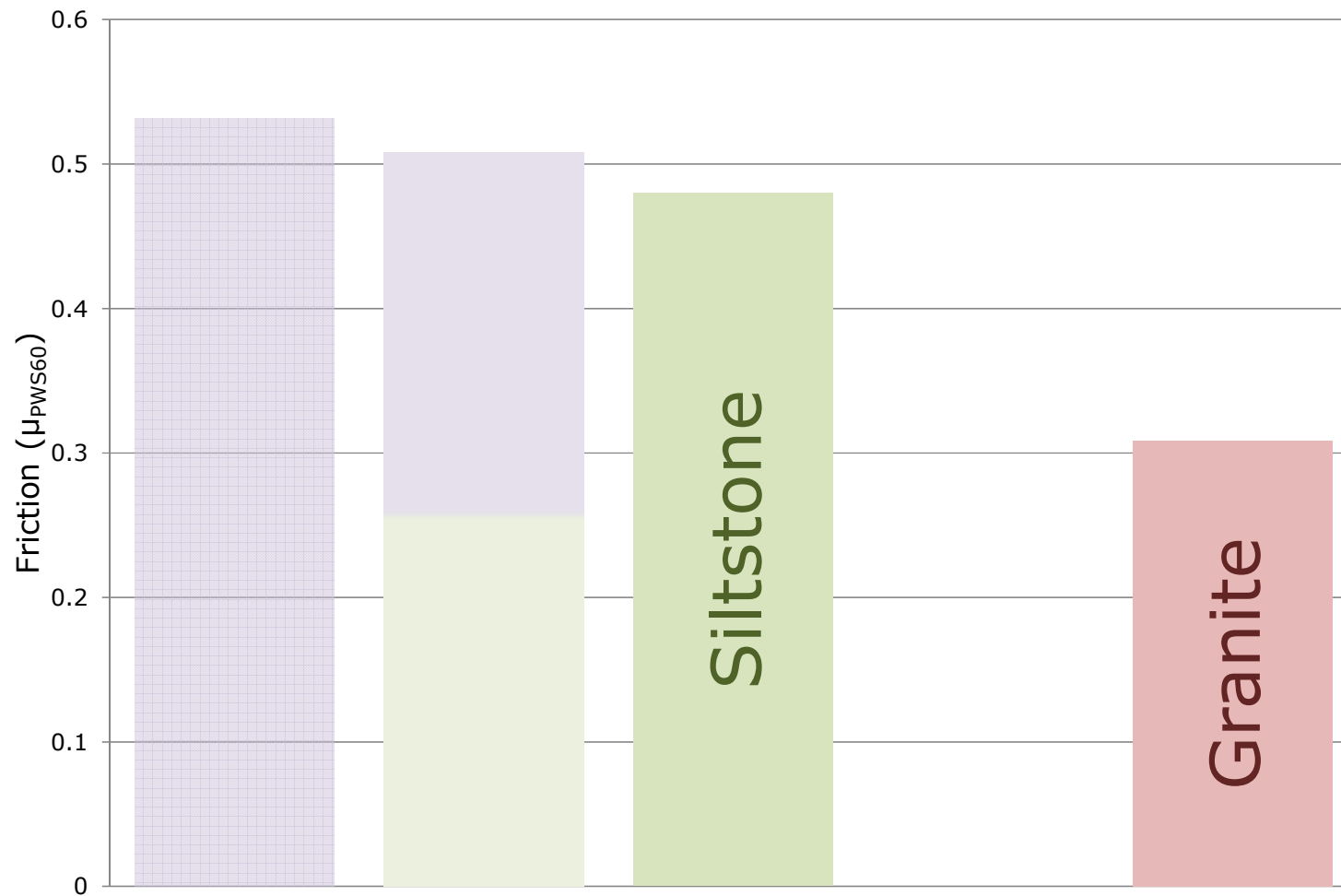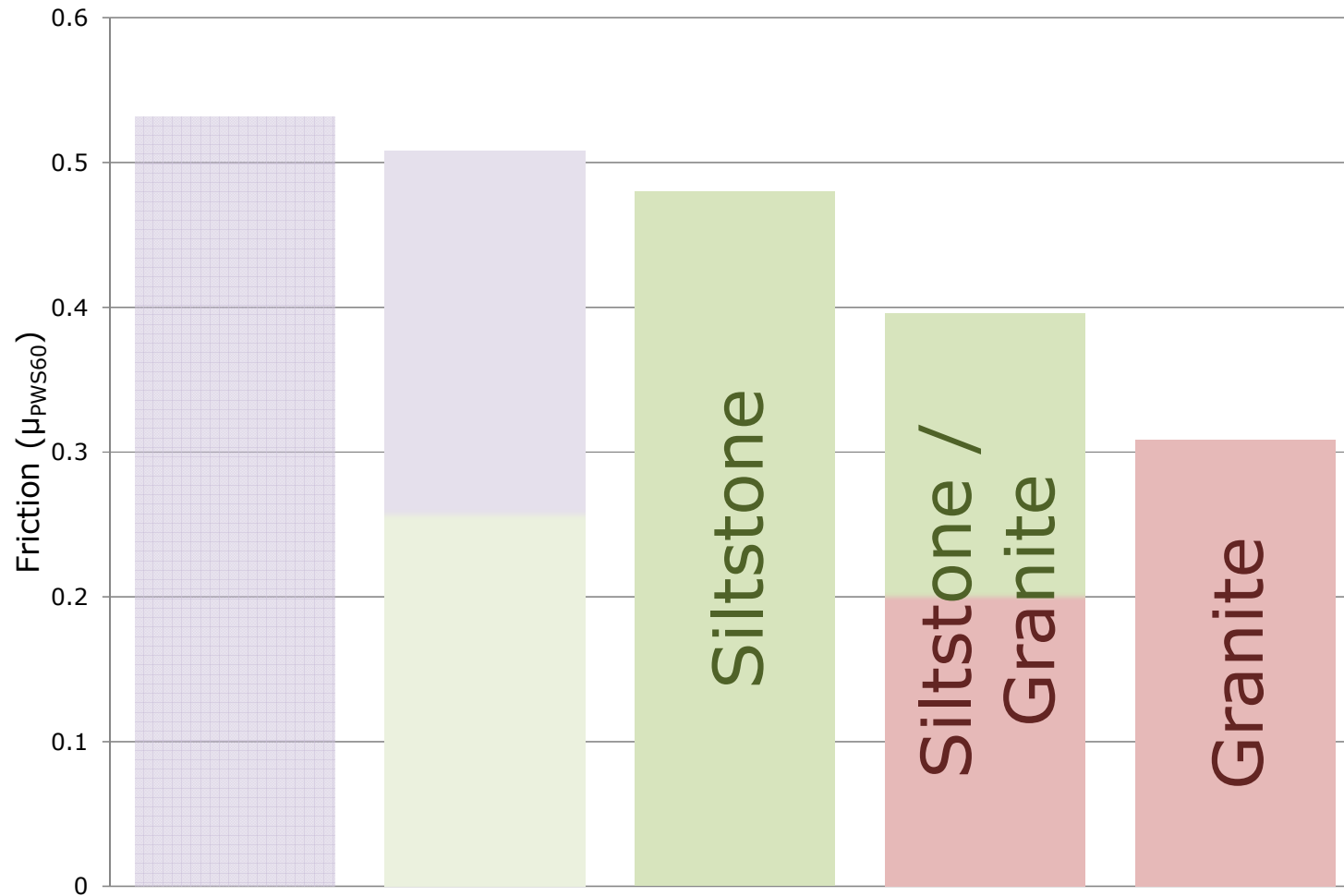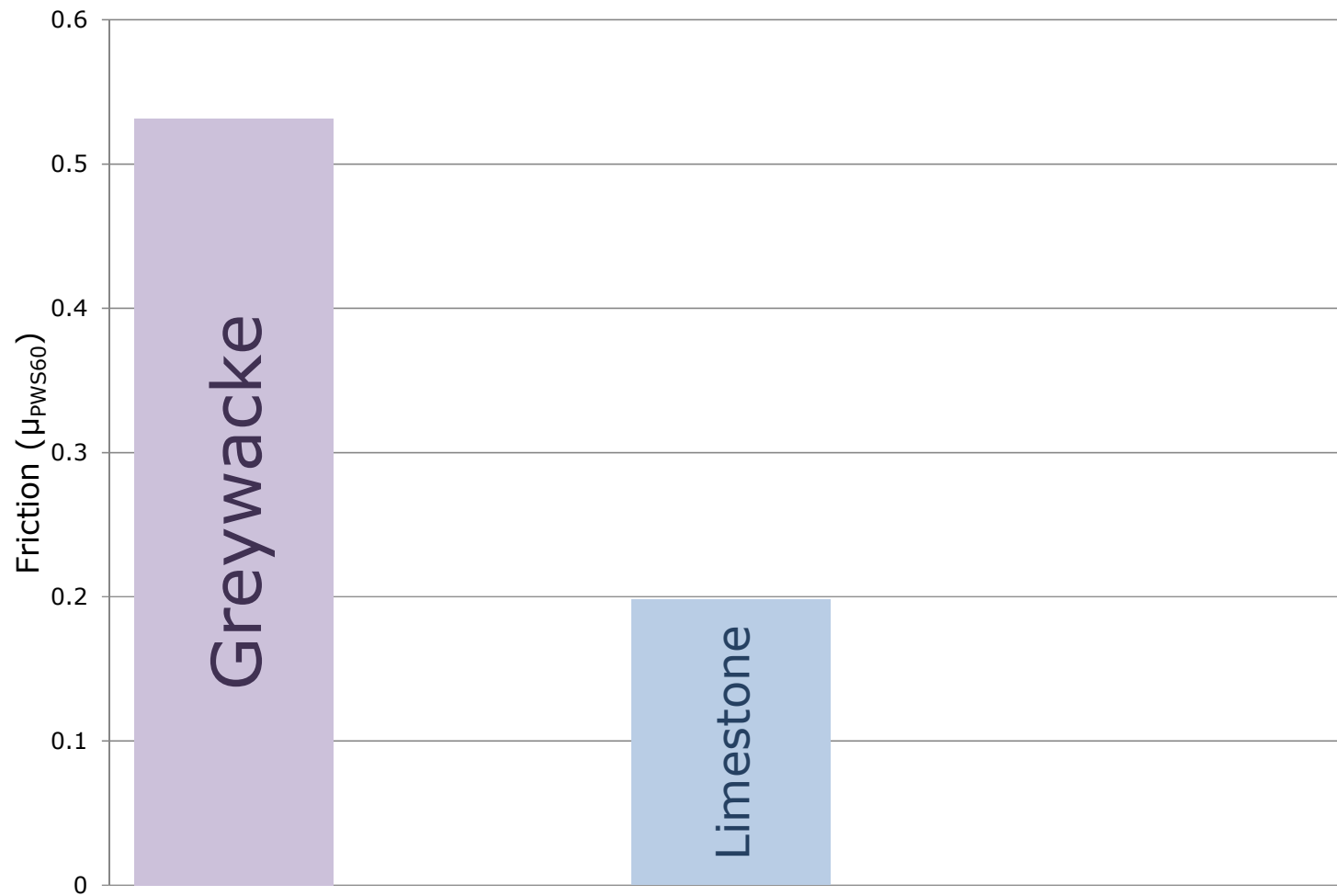# Principle - mixing coarse aggregate

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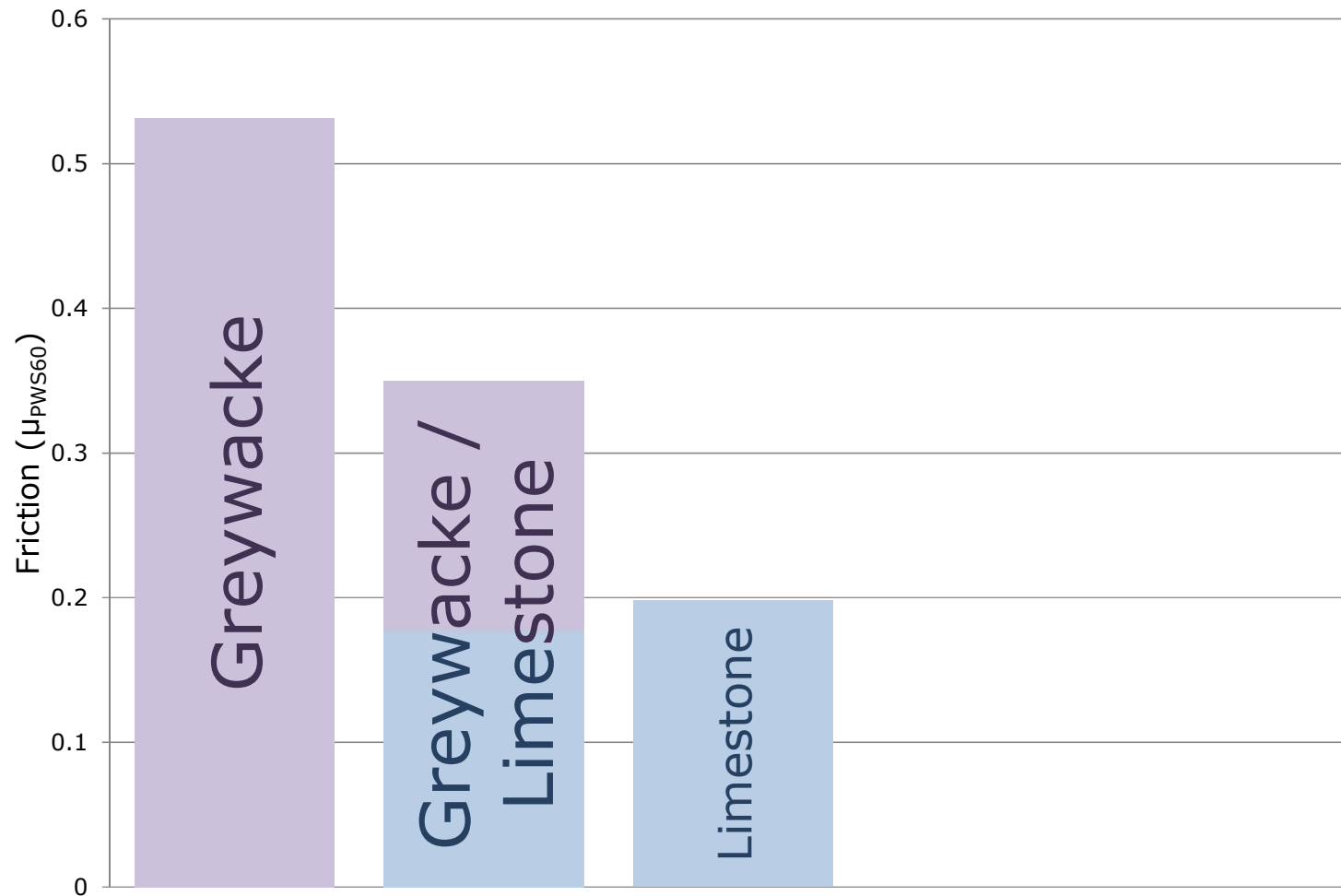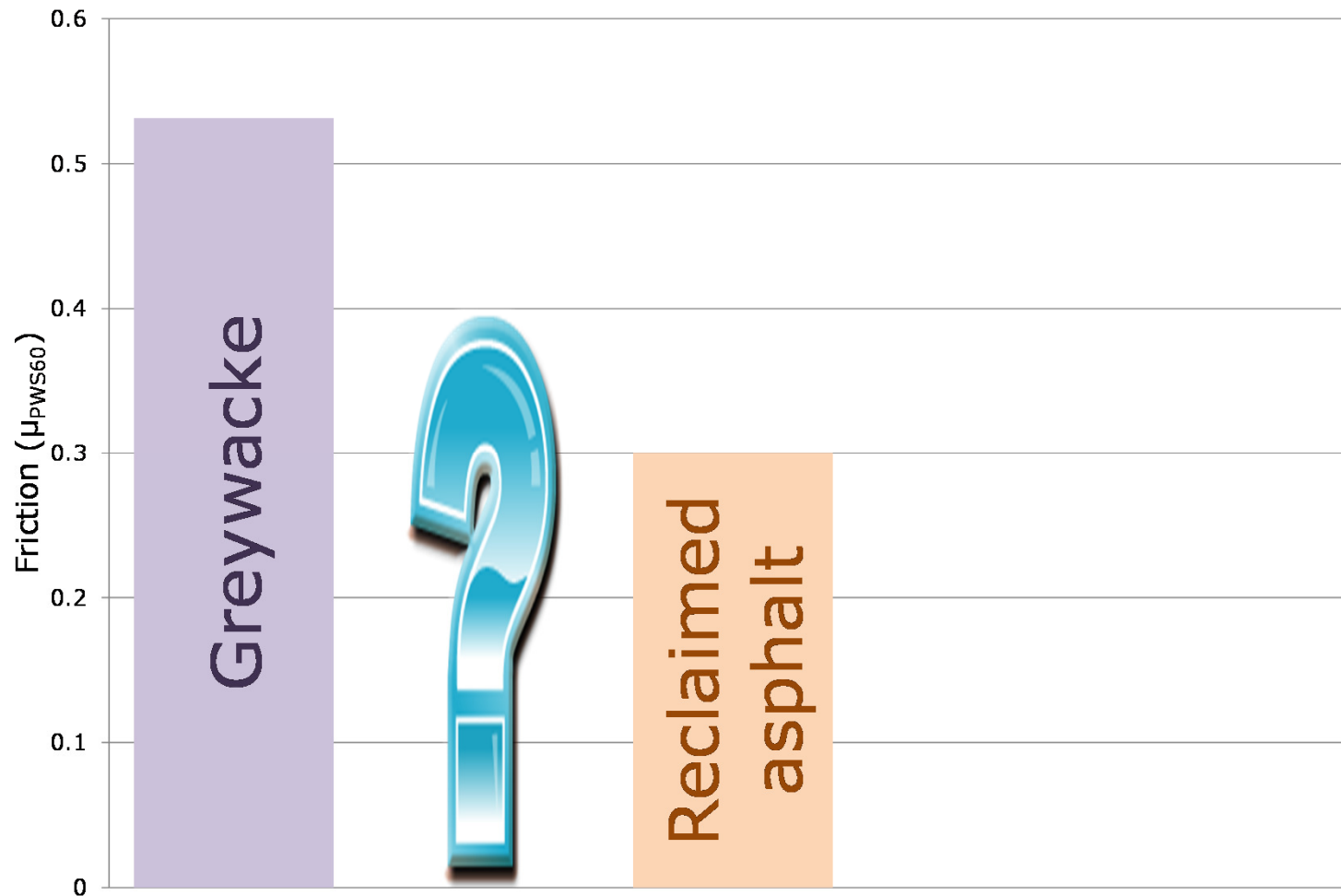
Principle - mixing coarse aggregate

Principle - mixing coarse aggregate

Principle - mixing reclaimed asphalt

Principle - mixing reclaimed asphalt

Principle - mixing reclaimed asphalt

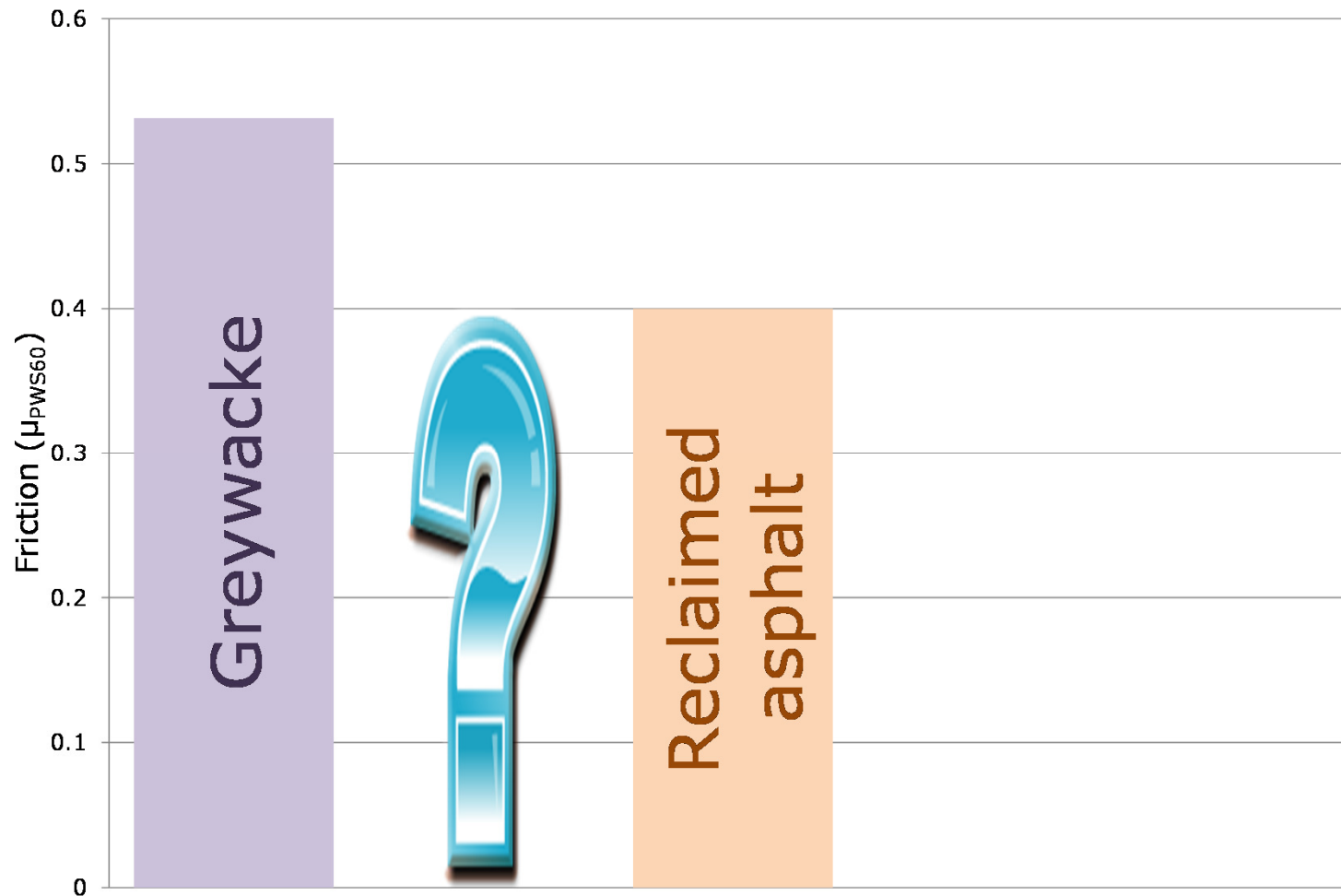# Principle - mixing reclaimed asphalt
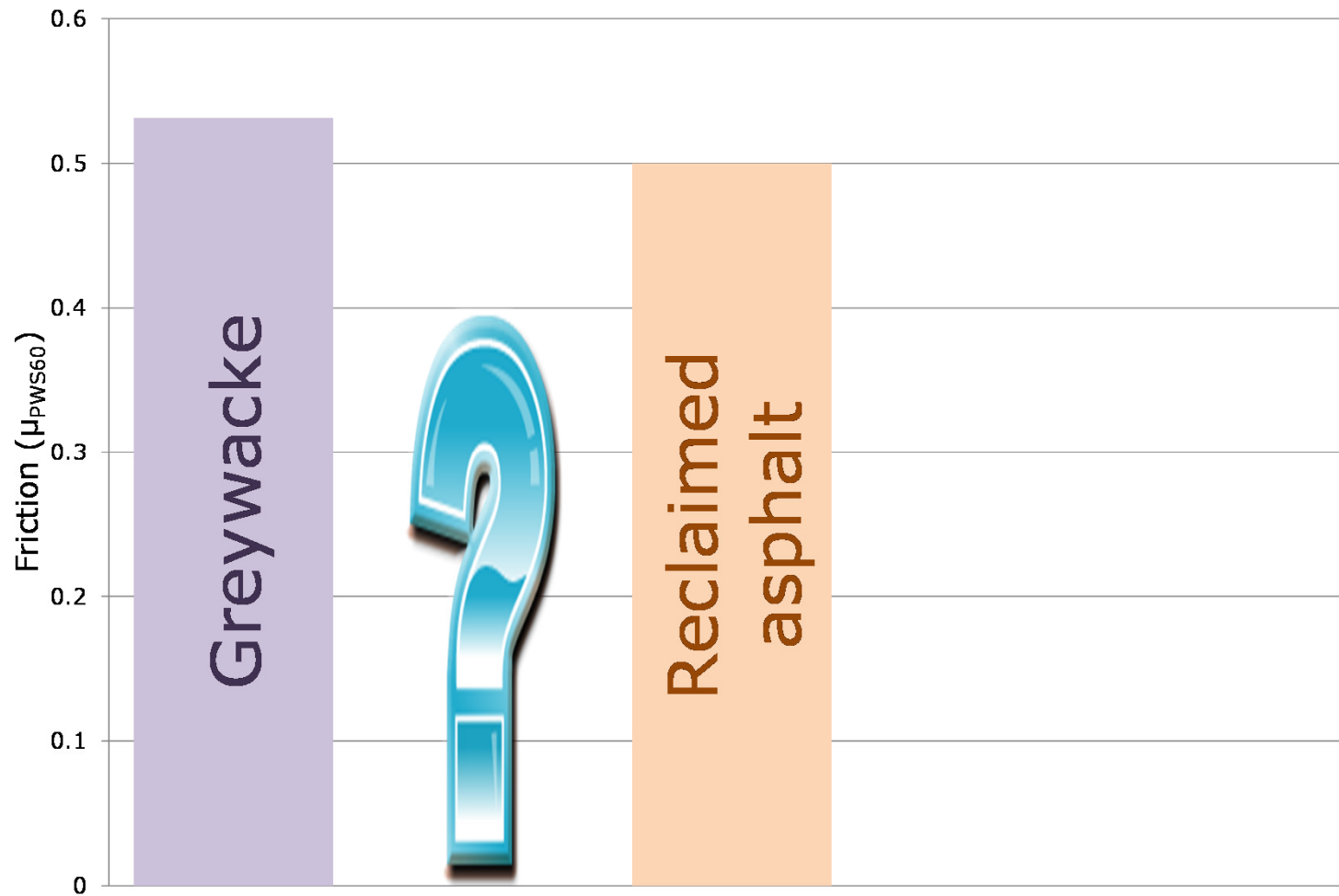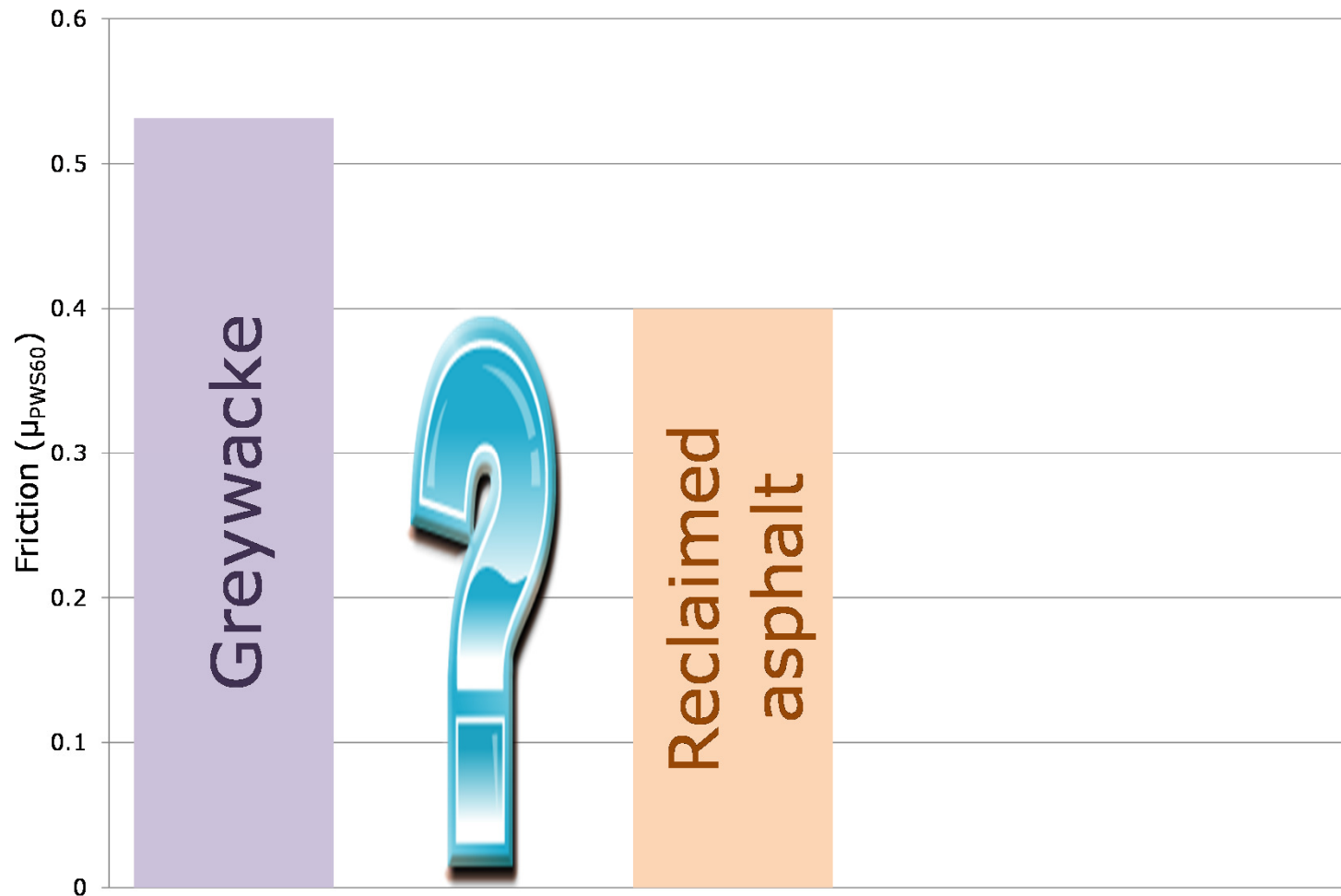
Principle - mixing reclaimed asphalt
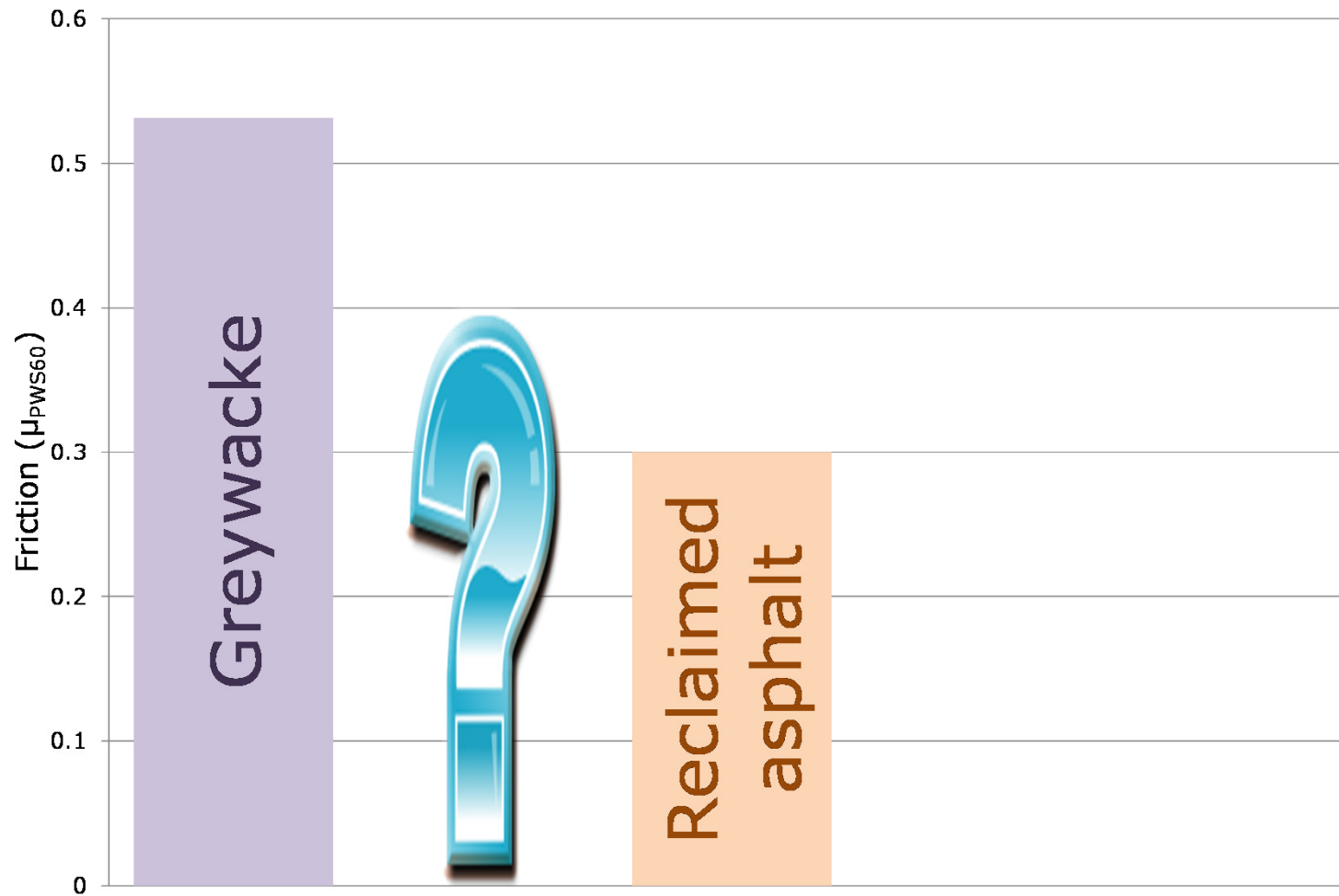
Principle - mixing reclaimed asphalt
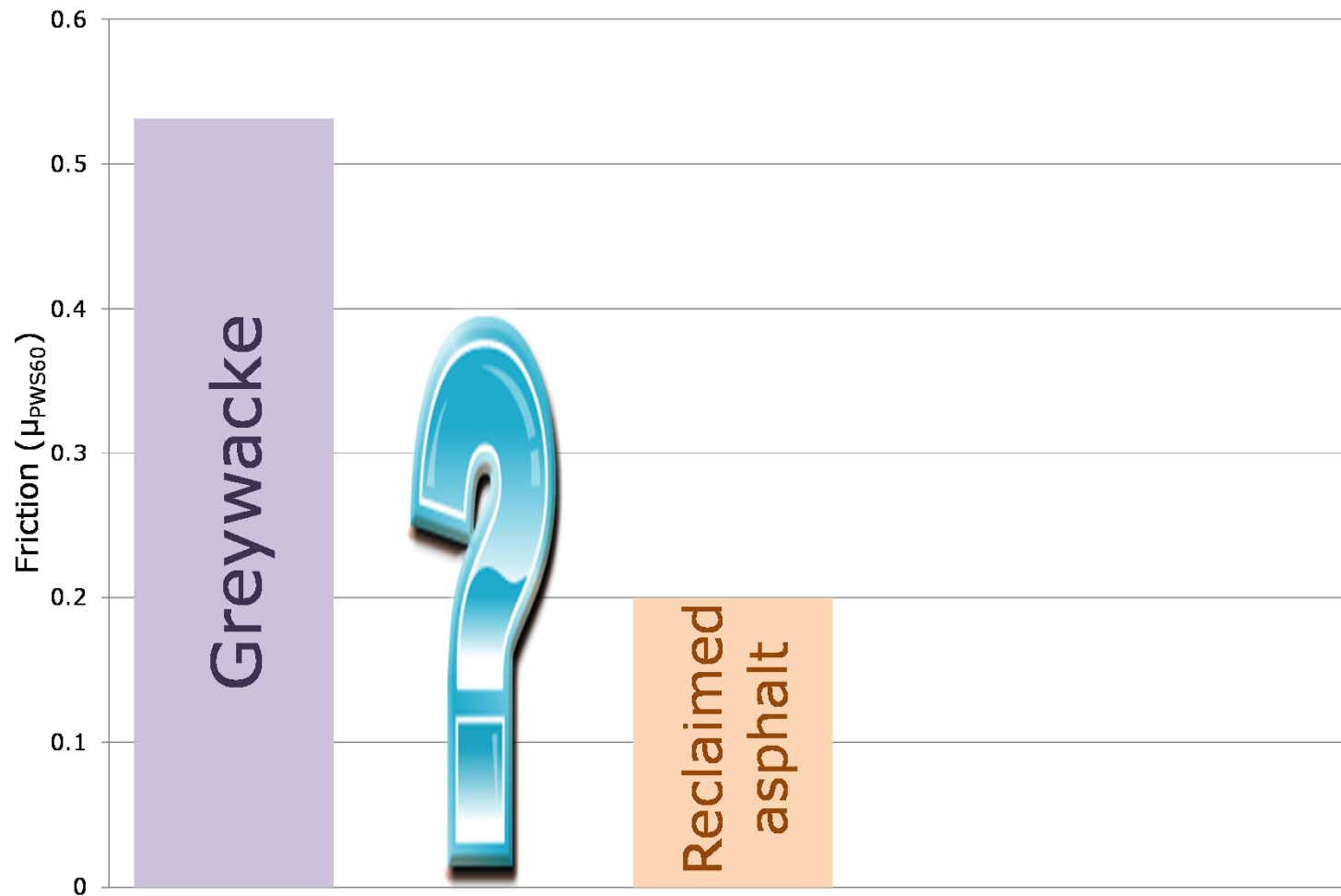
Principle - mixing reclaimed asphalt
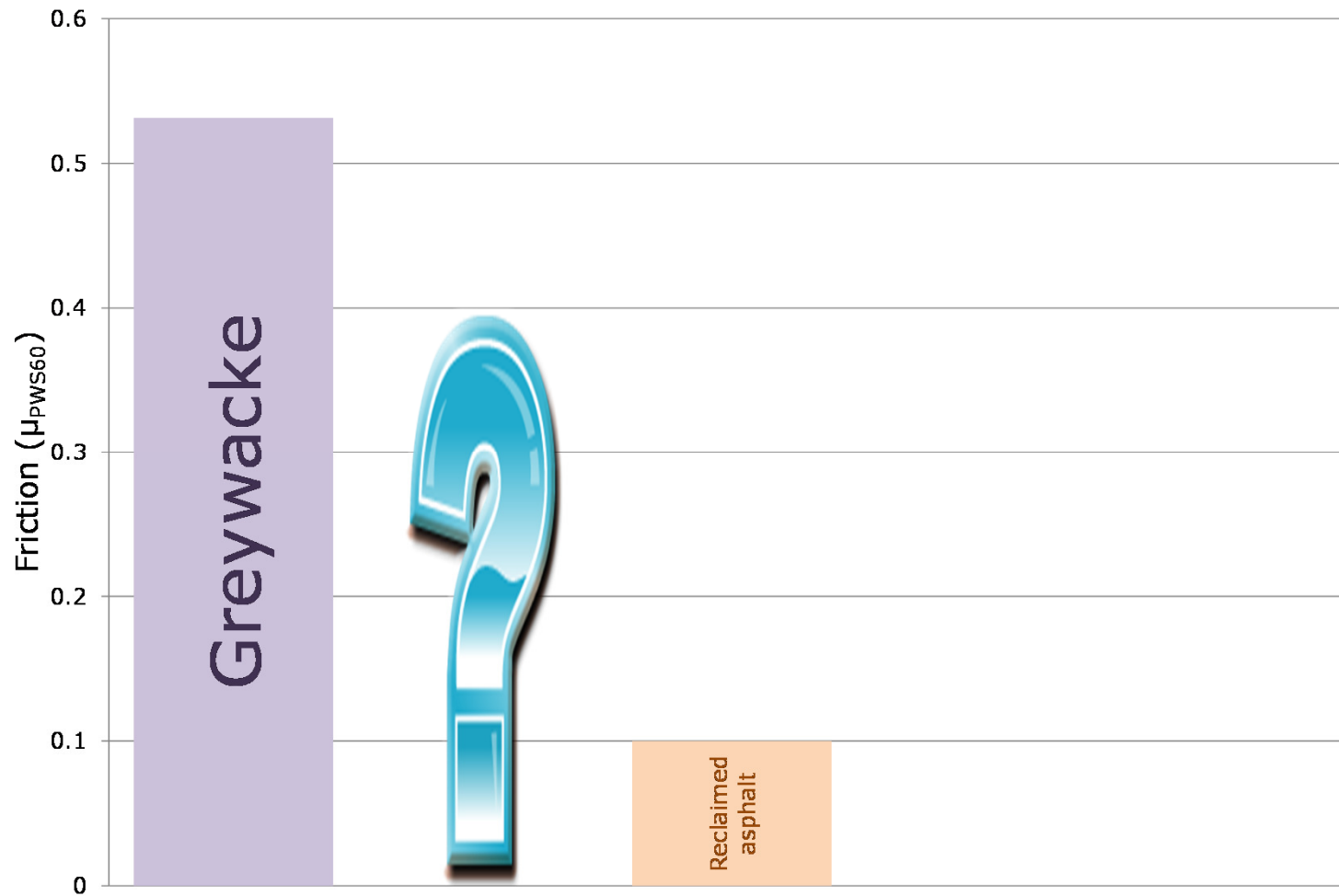
Laboratory investigation

- Reclaimed asphalt from mixed stockpile

- Incorporate into SMA in different proportions by mass

- Measure friction

- Compare with effect of adding limestone virgin aggregate

Laboratory investigation – mixing RA
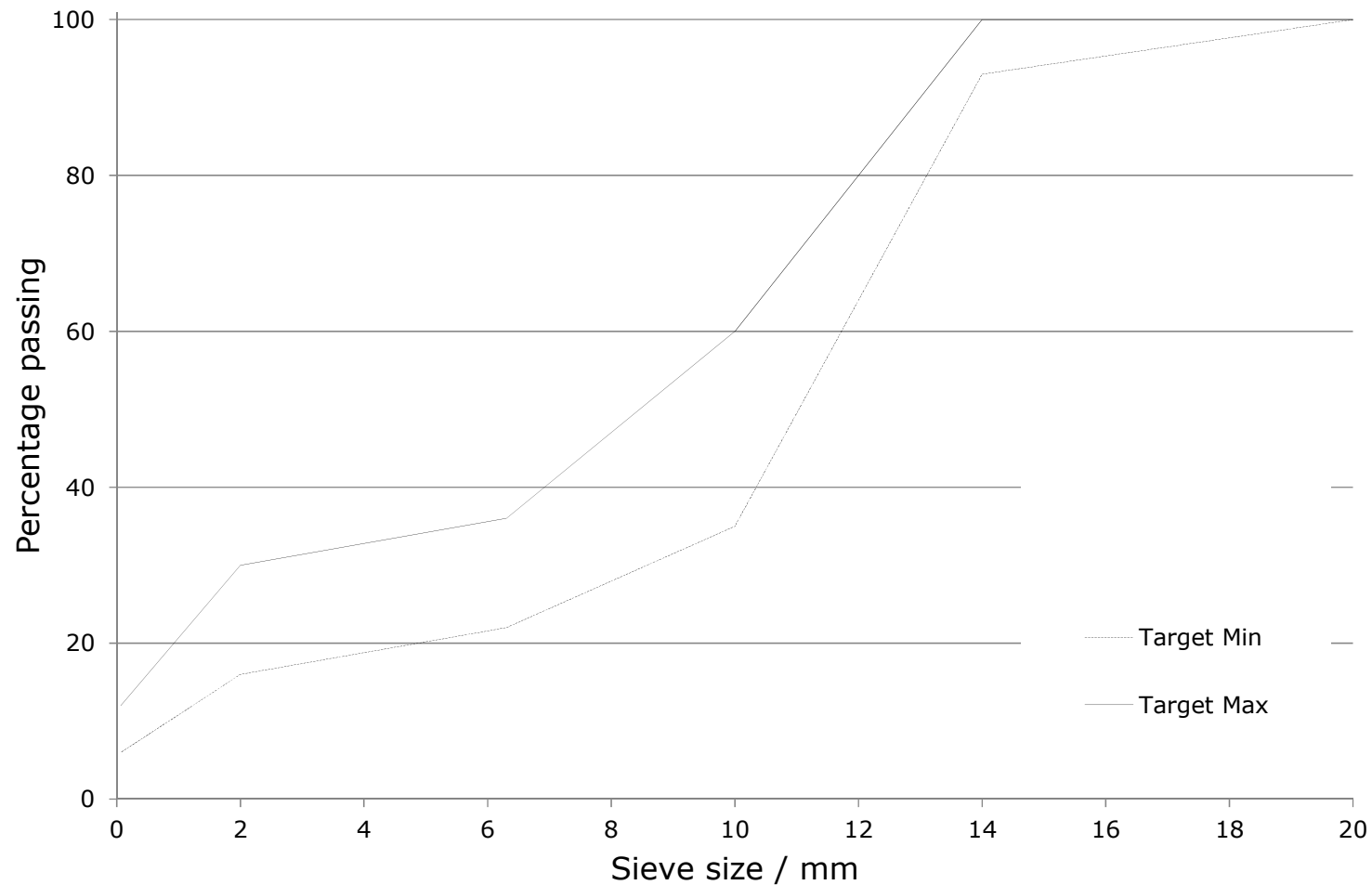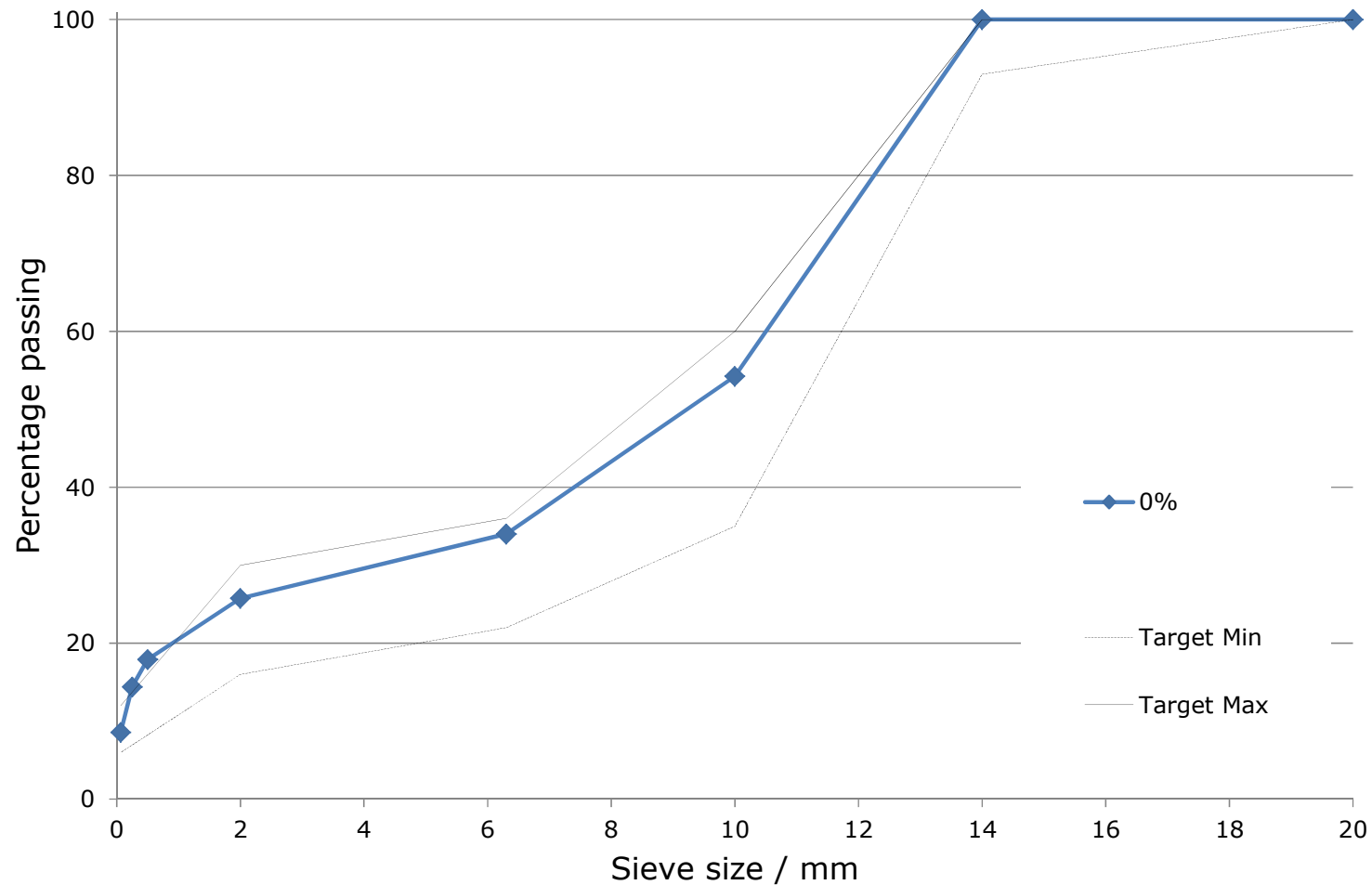
Laboratory investigation – mixing RA

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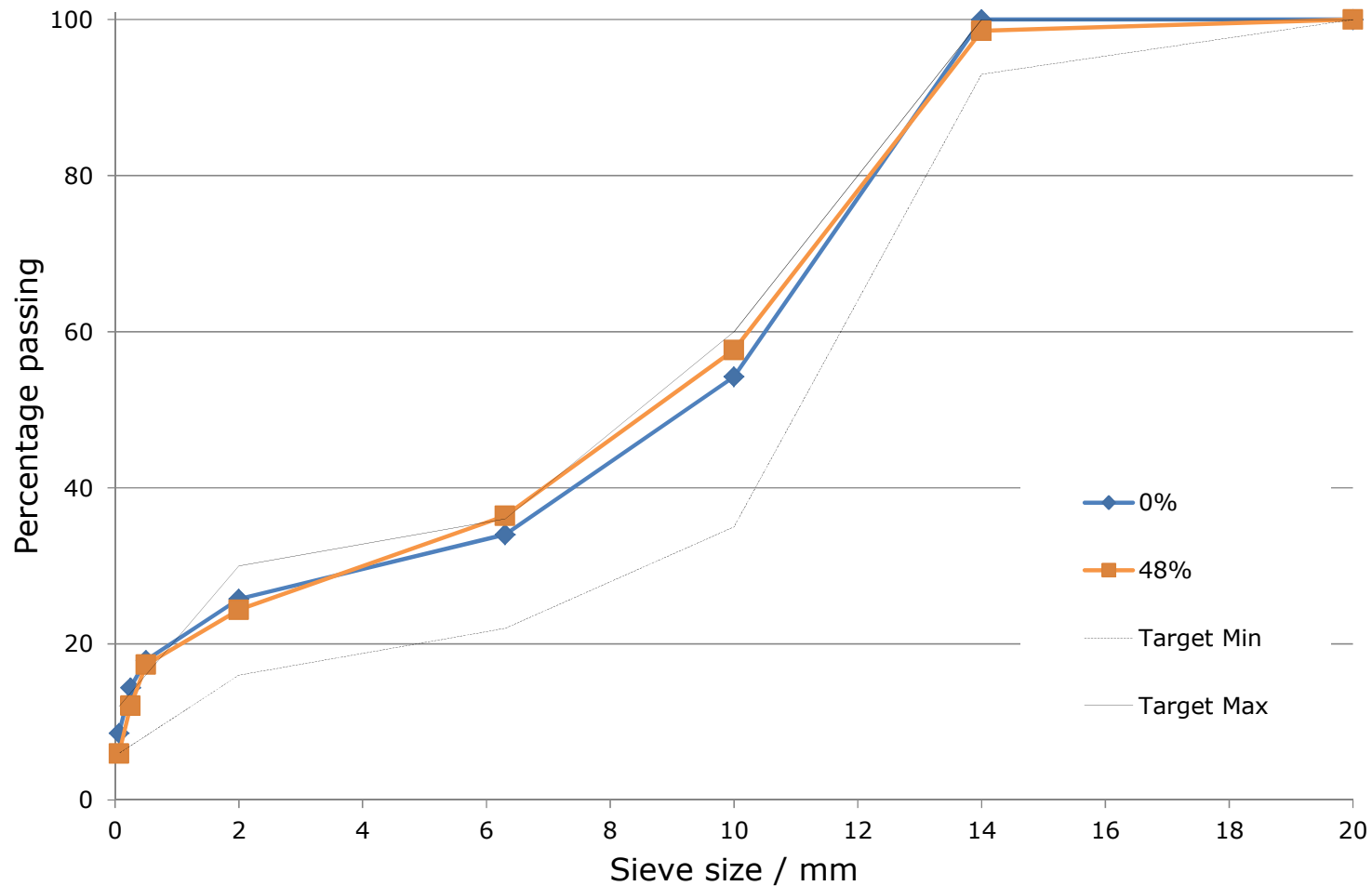
Laboratory investigation – friction
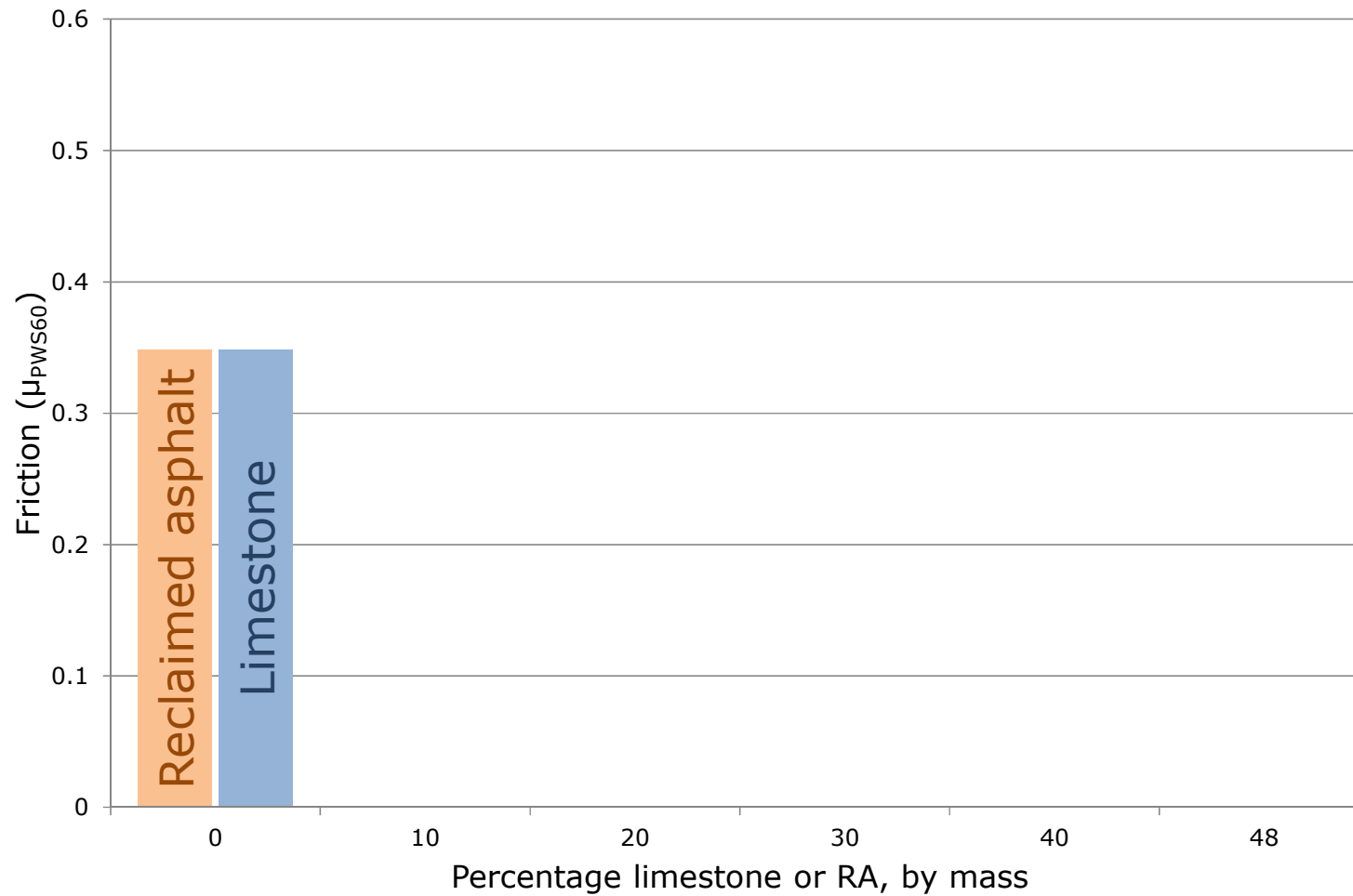
Laboratory investigation – friction
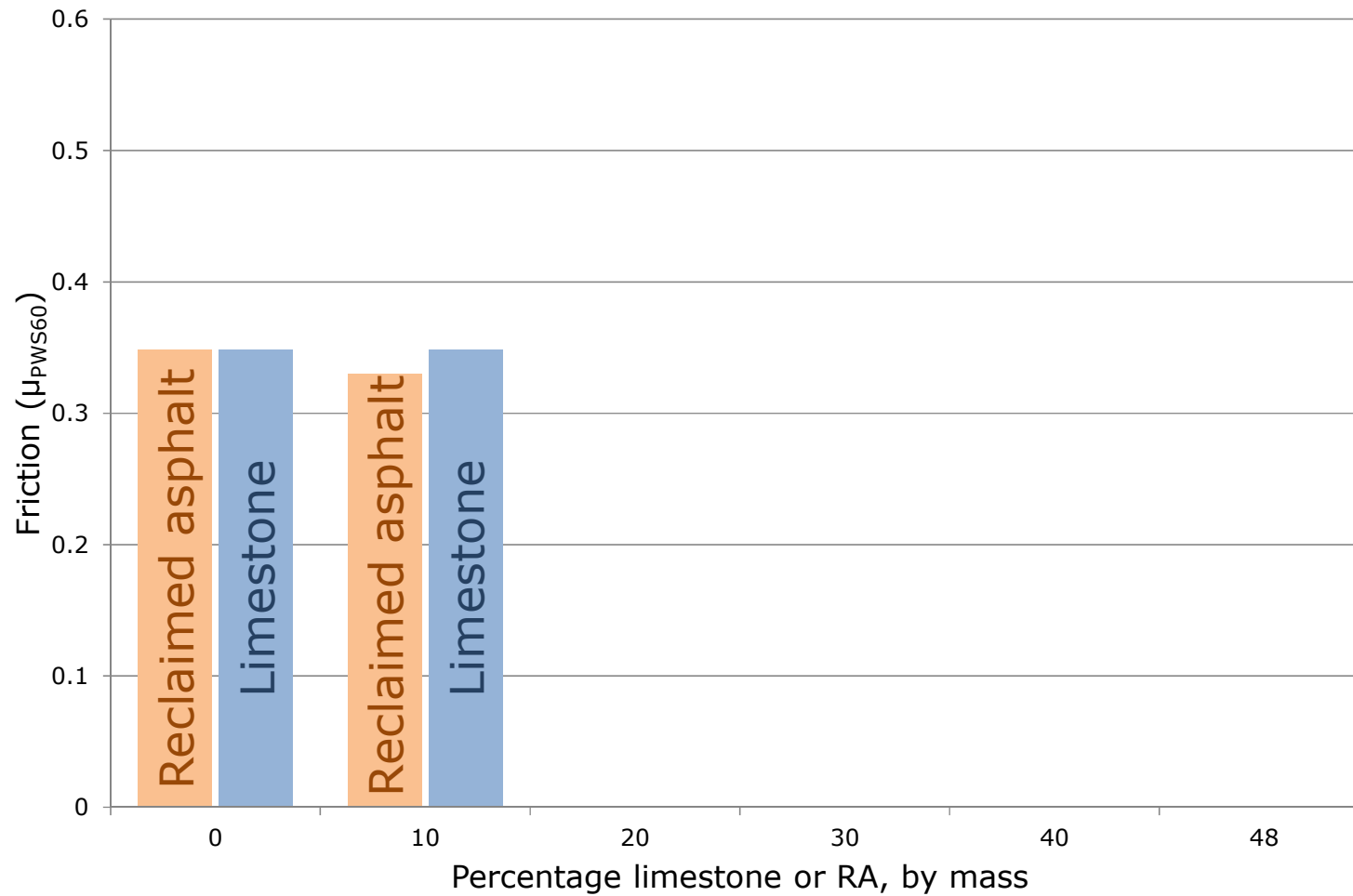
Laboratory investigation – friction
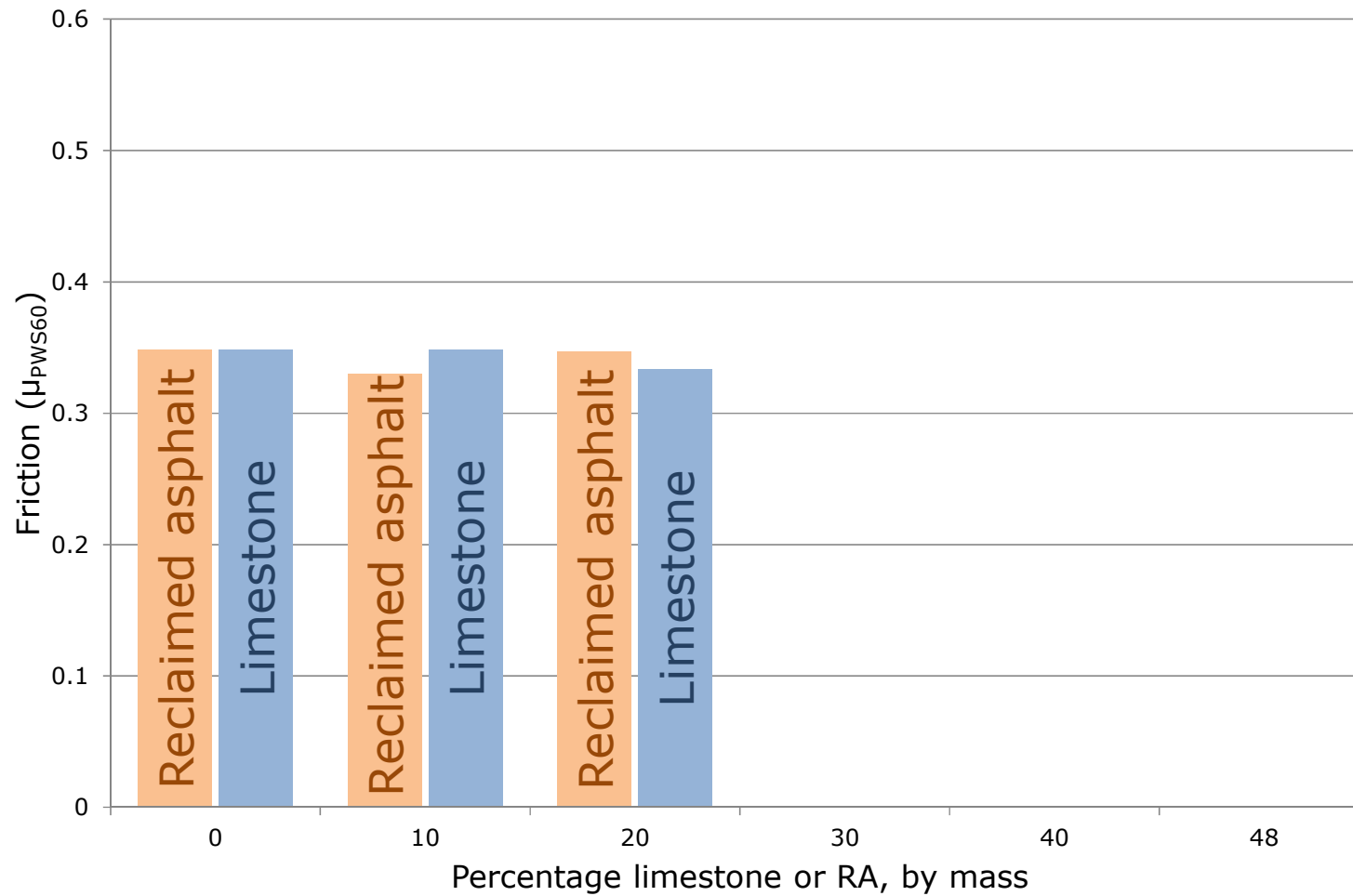
Laboratory investigation – friction
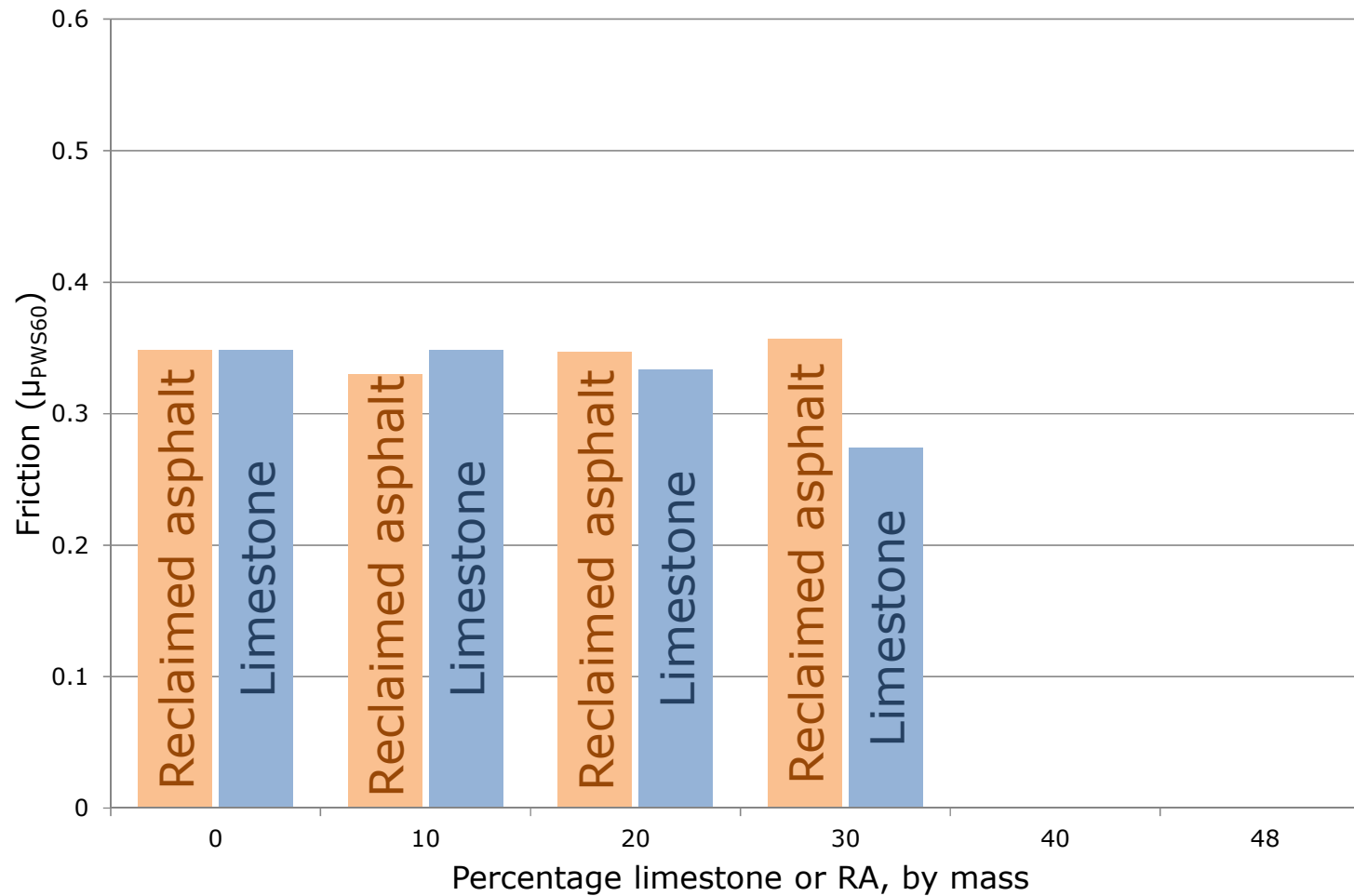
Laboratory investigation – friction
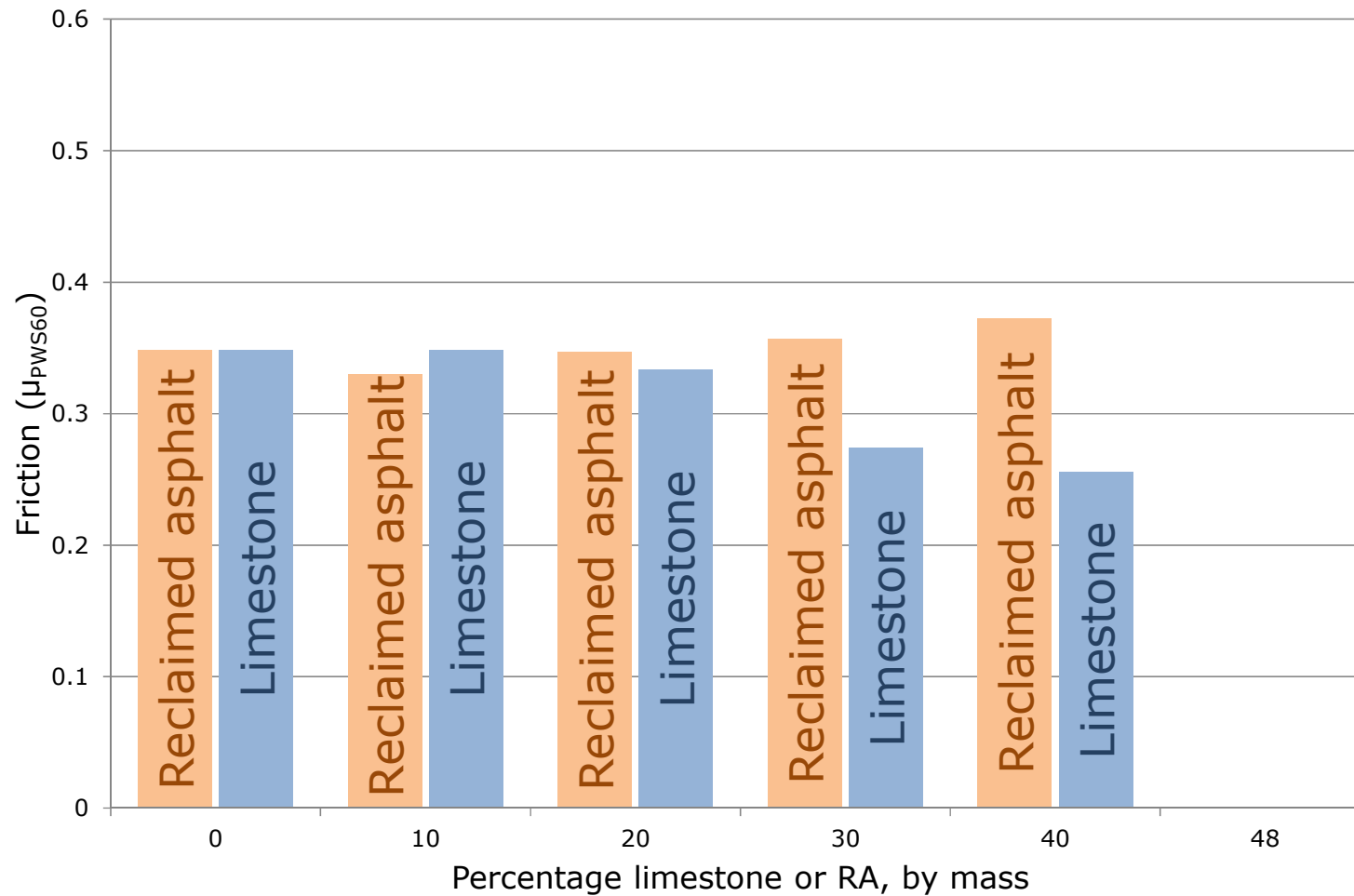
Laboratory investigation – friction
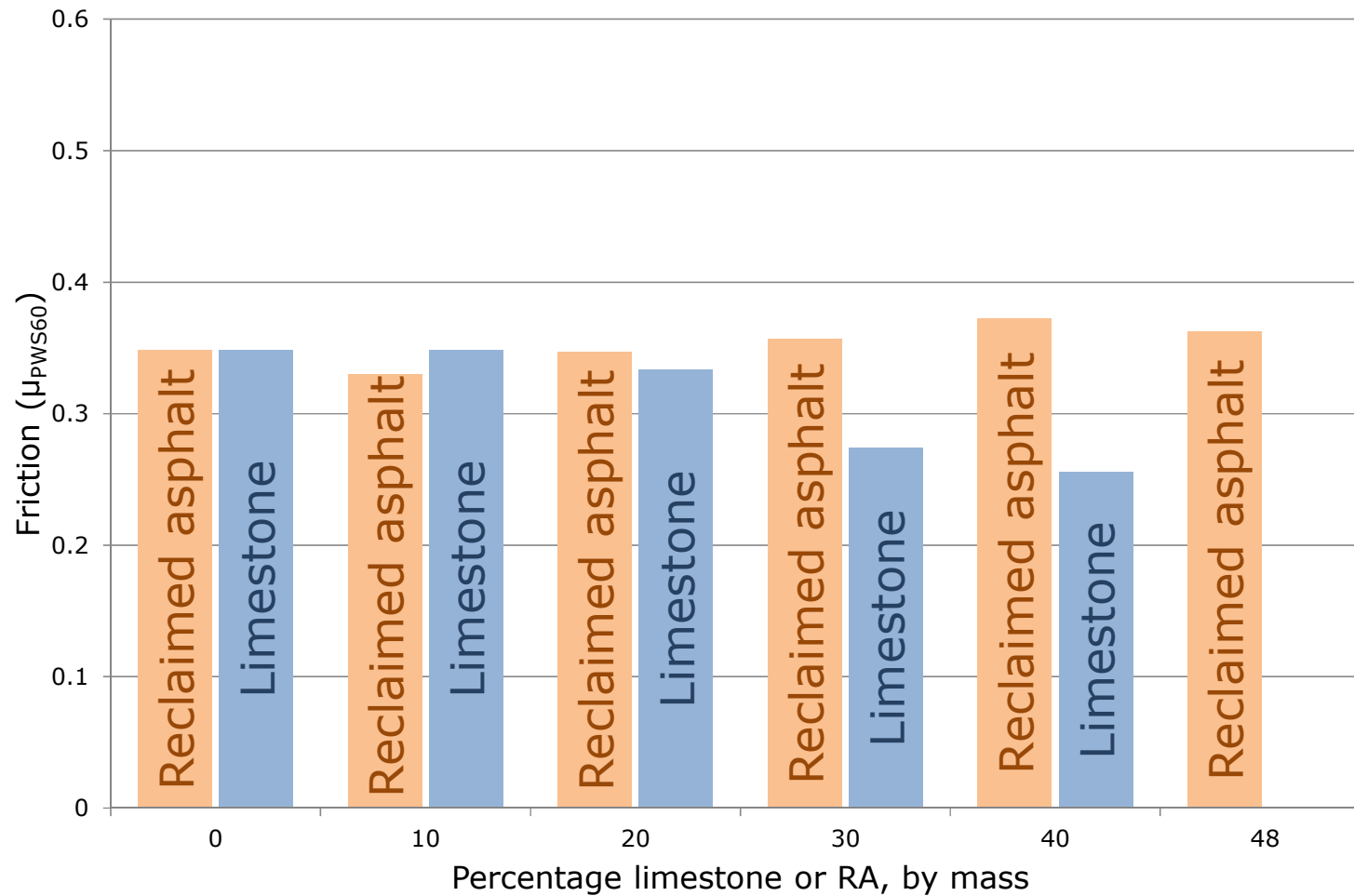
Laboratory investigation – next steps

- Reclaimed asphalt from more stockpiles

- Addition of RA to other virgin aggregates

- Explore aggregate variability within stockpiles

- Reclaimed asphalt from surface course stockpile or planings

Scenarios

- **Surface course RA**
  - Original surface course properties well known, and meet requirements of new location.
  - Original surface course properties well known, but do not meet requirements of new location.

  - Original surface course properties not well known.

- **Mixed RA**

Scenarios

- **Surface course RA**
  - Original surface course properties well known, and meet requirements of new location. No restriction on amount of RA.
  - Original surface course properties well known, but do not meet requirements of new location.

  - Original surface course properties not well known.

- **Mixed RA**

Scenarios

- **Surface course RA**

  - Original surface course properties well known, and meet requirements of new location. No restriction on amount of RA.

  - Original surface course properties well known, but do not meet requirements of new location. Dependent on virgin aggregate used. Predict blended friction using mass ratio formula.

  - Original surface course properties not well known.

- **Mixed RA**

Scenarios

- Surface course RA

  - Original surface course properties well known, and meet requirements of new location. No restriction on amount of RA.

  - Original surface course properties well known, but do not meet requirements of new location. Dependent on virgin aggregate used. Predict blended friction using mass ratio formula.

  - Original surface course properties not well known. Depends on new location requirement. If low/medium PSV required then no restriction on RA addition. If high PSV required then restrict to 10% unless lab investigation suggests otherwise.

- Mixed RA

Scenarios

- Surface course RA
  - Original surface course properties well known, and meet requirements of new location. No restriction on amount of RA.
  - Original surface course properties well known, but do not meet requirements of new location. Dependent on virgin aggregate used. Predict blended friction using mass ratio formula.
  - Original surface course properties not well known. Depends on new location requirement. If low/medium PSV required then no restriction on RA addition. If high PSV required then restrict to 10% unless lab investigation suggests otherwise.

- Mixed RA
  - 10% restriction, for now.
  - Lab work suggests potential for relaxation.

Thank you

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20th May 2014
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Thank you

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TRL color palette

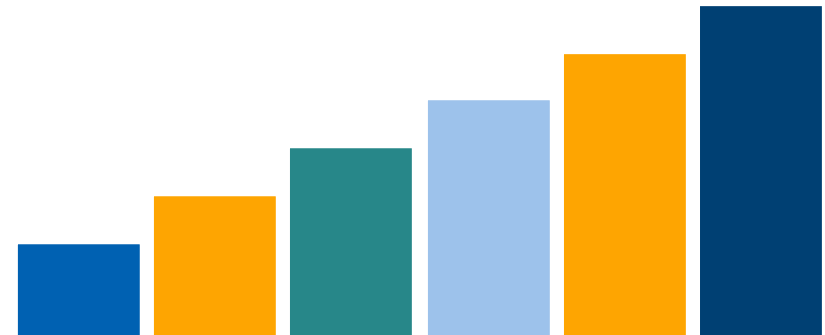Main TRL PowerPoint colour swatches

Additional colors: gray scale

Diagram colors