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# Performance-based contracts for asphalt surfacings-a contractors experience

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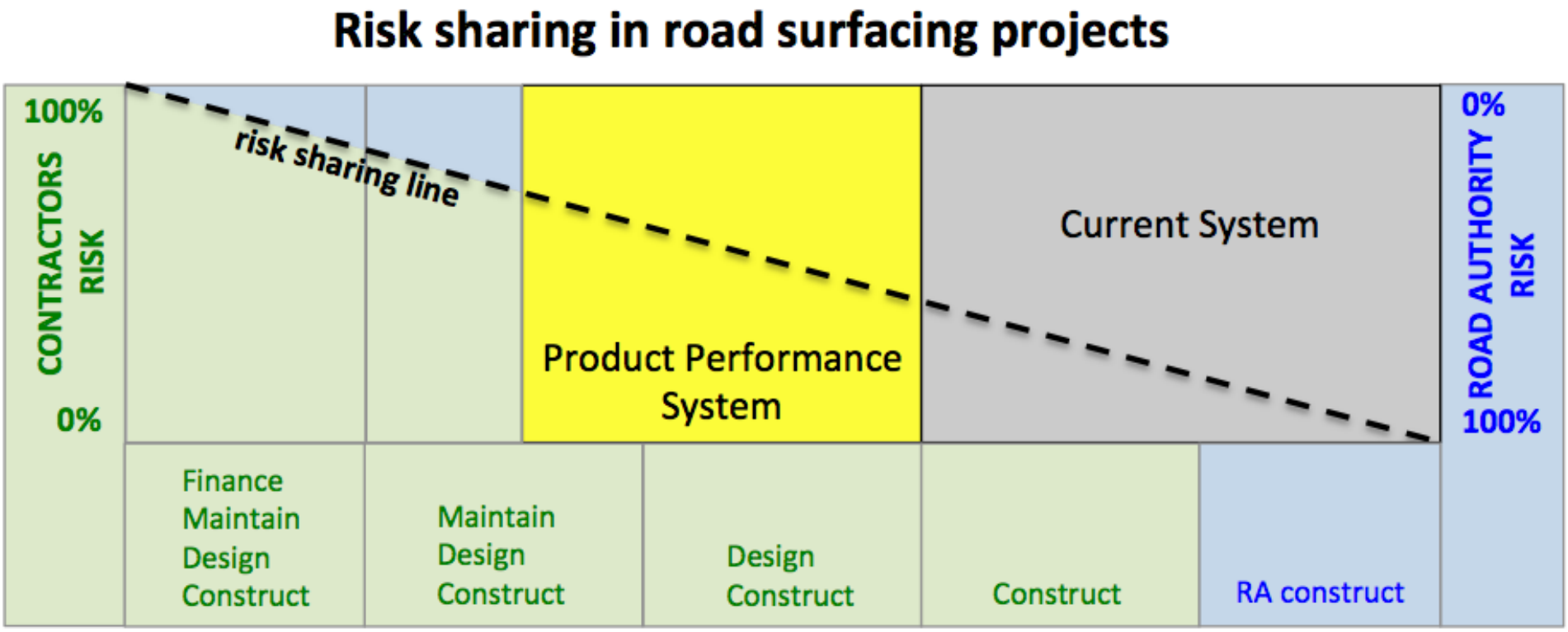
- Increasing need for higher functional performance
  - Skid resistance, texture depth, impermeability
- Transferring increased responsibility to the asphalt contractor
- New form of contracting
  - Extended warrantee on functional properties
  - Contractor carries technical & financial risk
  - Encourages innovation
  - Promotes increased economies & efficiencies

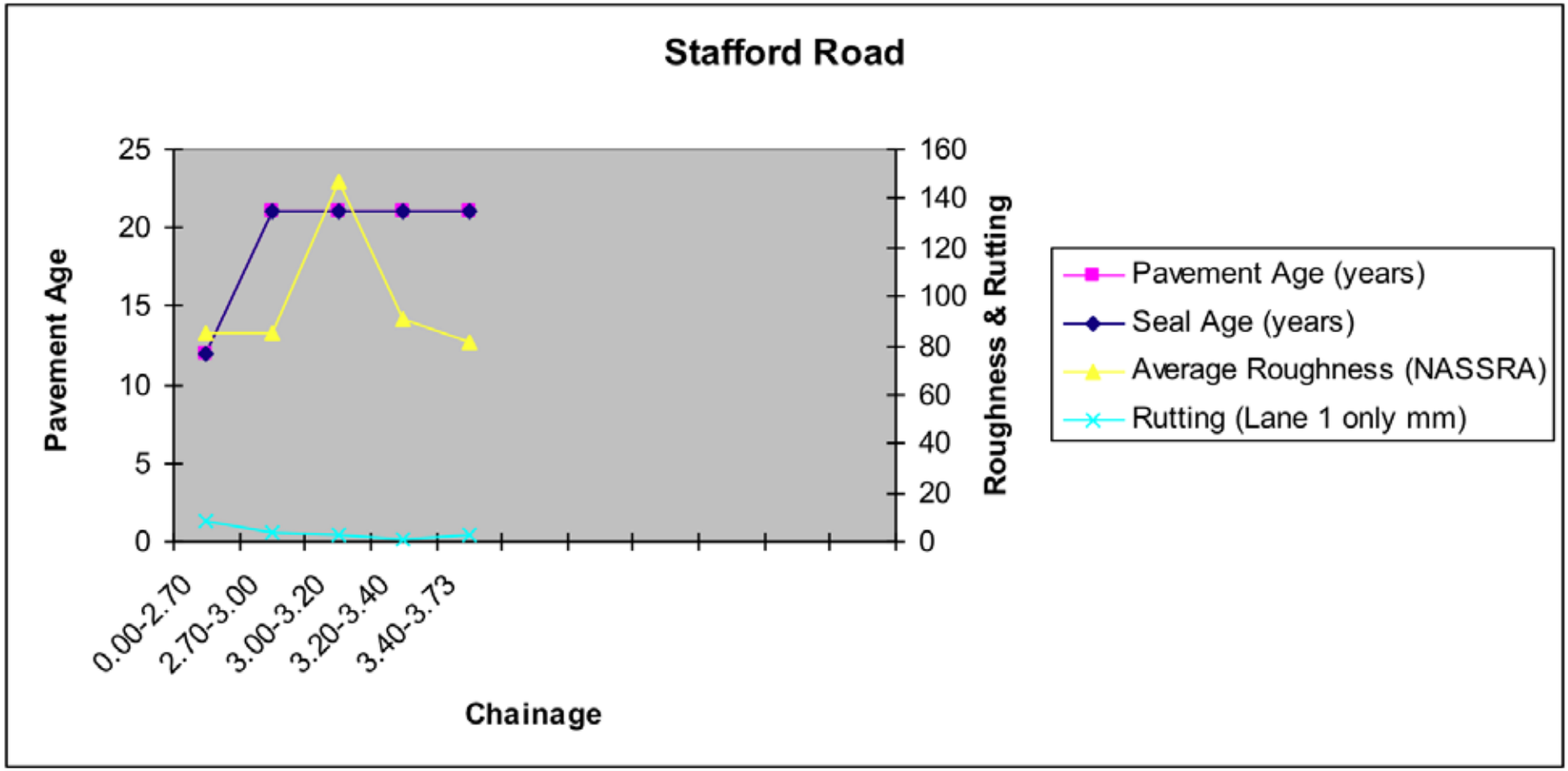
# Risk sharing on road surfacing projects



- Type B2 Low permeability SMA 30 -40mm
- Assessed against
  - Visual defects
  - Straight edge deviation
  - Surface evenness
  - Surface texture depth
- Assessed at
  - Completion
  - 3 months
  - 24 months

| Property | Type B2 |
|---|---|
| Bond coat (l/m², min) | 0.2 |
| Compaction standard (CS) | As nominated by the contractor |
| Permeability (µm/s) | 15 max |
| Binder volume (%, min) | 14 |
| Fatigue life @ 600 µ strain, min | >1 million cycles |
| Rut depth (mm, max) | 2.0 |
| Abrasion loss (%, max) | 15 |
| Binder drainage (%, max) | 0.3 |

- Metro Region of QTMR project – two tenders
  - Stamford Rd 3.6km  and Stafford Road 1km
  - Type B2 asphalt (SMA low permeable, 30 – 40mm)
  - 10 000 vpd with 10% heavy – metropolitan traffic
- Existing pavement condition
  - Deflections < 0.85mm
  - No prior information on pavement design
  - No records of pavement maintenance or materials
  - Cross section gradient varied 3% to 8%
  - Cracking up to 20mm in fast lane for majority of works
  - Leaking underground water mains at east of works


Stafford Road
Pavement Age
Roughness & Rutting
Chainage
0
5
10
15
20
25
0
20
40
60
80
100
120
140
160
0.00-2.70
2.70-3.00
3.00-3.20
3.20-3.40
3.40-3.73
Pavement Age (years)
Seal Age (years)
Average Roughness (NASSRA)
Rutting (Lane 1 only mm)


Ch 454


Ch 410


Ch 316

1. Extent and scope of pre-treatment requirements
    - Lack of as-built data or pavement design
    - Services of engineering consultant engaged
2. Surfacing selection and mix design
    - DuraPave based on NSW experience – RTA RPB125 spec
    - New binder not used previously
3. Quantifying risk
    - 3 to 24 mth change in defects liability / warrantee
    - Uncertainty of the underlying pavement conditions
4. Additional controls
    - Philosophy of building quality into the process adopted

- Pretreatment
  - 50 mm & 100 mm deep patches
  - Bitak stress absorbing fabric strip over
    - Minor cracks which had not been patched
    - Cracks at the bottom of excavated areas
  - Full depth profiling to remove rutted asphalt
  - SAMI seal placed on full width (S4.5S, 1.7l/m2, 10mm)
- Construction
  - 35mm DuraPave 10 placed on SAMI in same shift
  - Surface gritted with minus 2mm aggregate

# Stafford Road – after surfacing

# Durapave 10 – Stafford Road

- Mix performance

| Property | Specification | Actual |
|---|---|---|
| Compaction standard | > 93% CV | 92.6 – 94.4%CV |
| Permeability (µm/s) | 15 max | 10 – 29 |
| Binder volume (%, min) | 14 | 12.9 - 14 |
| Fatigue life @ 600 µ strain, min | >1 million cycles | 2.1 million cycles |
| Rut depth (mm, max) | 2.0 | 1.7 |
| Abrasion loss (%, max) | 15 | passed |
| Binder drainage (%, max) | 0.3 | passed |

- In-situ performance
- Visual assessment
- Straight edge results
- Road roughness results
- Surface texture depth measurements

# Key Learnings

1. Asphalt production and quality control
2. Transporting of mix
3. Treatment and road preparation
4. Asphalt paving
5. Asphalt compaction
6. Field testing
7. Balancing mix properties
8. Tender and contract documentation

- Performance contracts provide ideal opportunity for innovation
- Contractors allowed to develop proprietary asphalt surfacing products
- Contractors required to invest more resources in finding ways to improve their product performance
- New set of risks are presented to RA & contractor
- Need for better information on existing pavement condition, maintenance and structure
- Easier to evaluate new products on sound pavements
- Develops improved working relationships and sharing of experience and expertise

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