

High Modulus Asphalt (HiMA) Technology Transfer (T²) November 2010 Progress report

Prepared for presentation at the 21th meeting of
the Roads Pavements Forum (RPF),
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Erik Denneman



Presentation structure

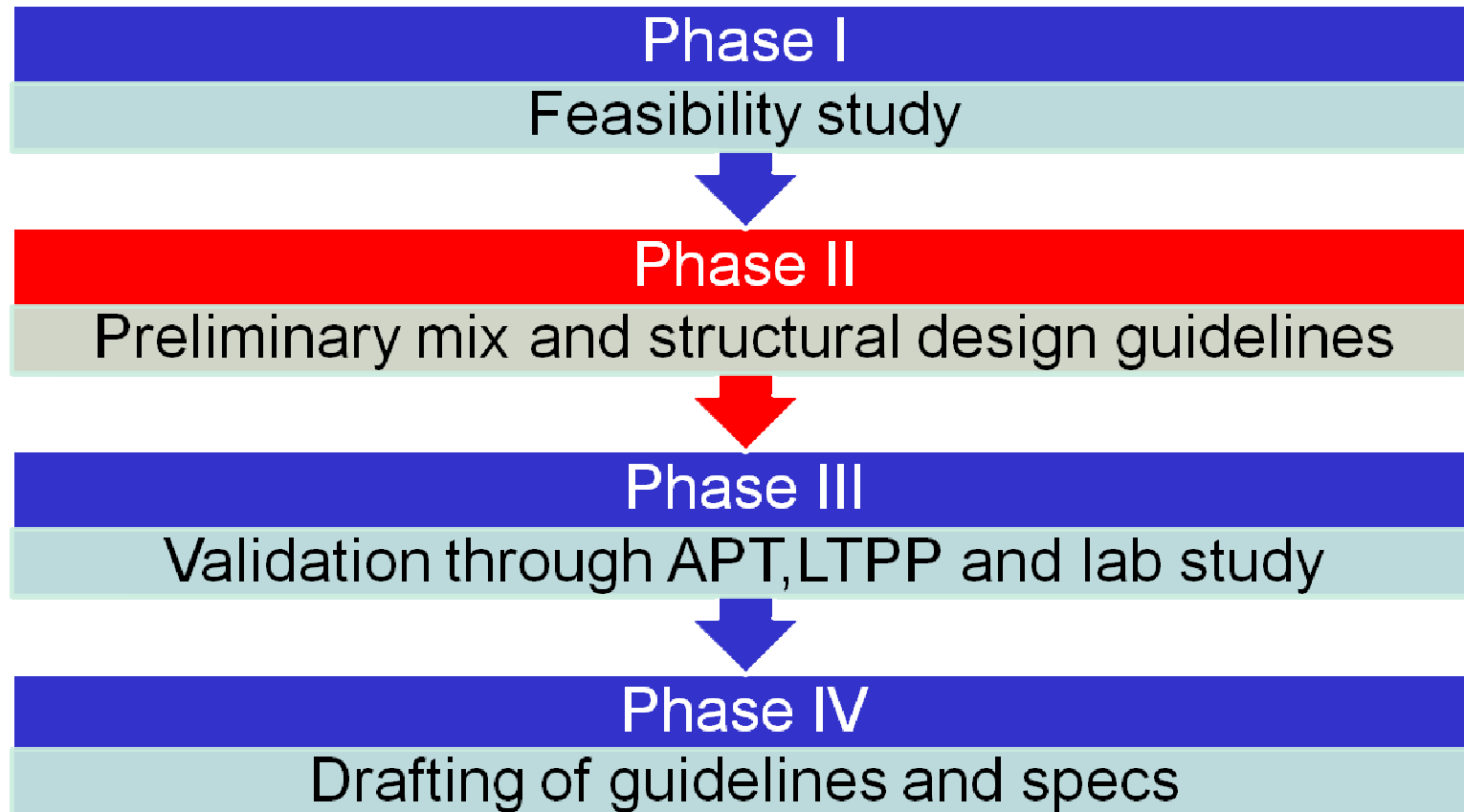
- Background on HiMA,
- The sabita HiMA T² project,
- Progress since November RPF
- Way forward.



High Modulus Asphalt (HiMA)

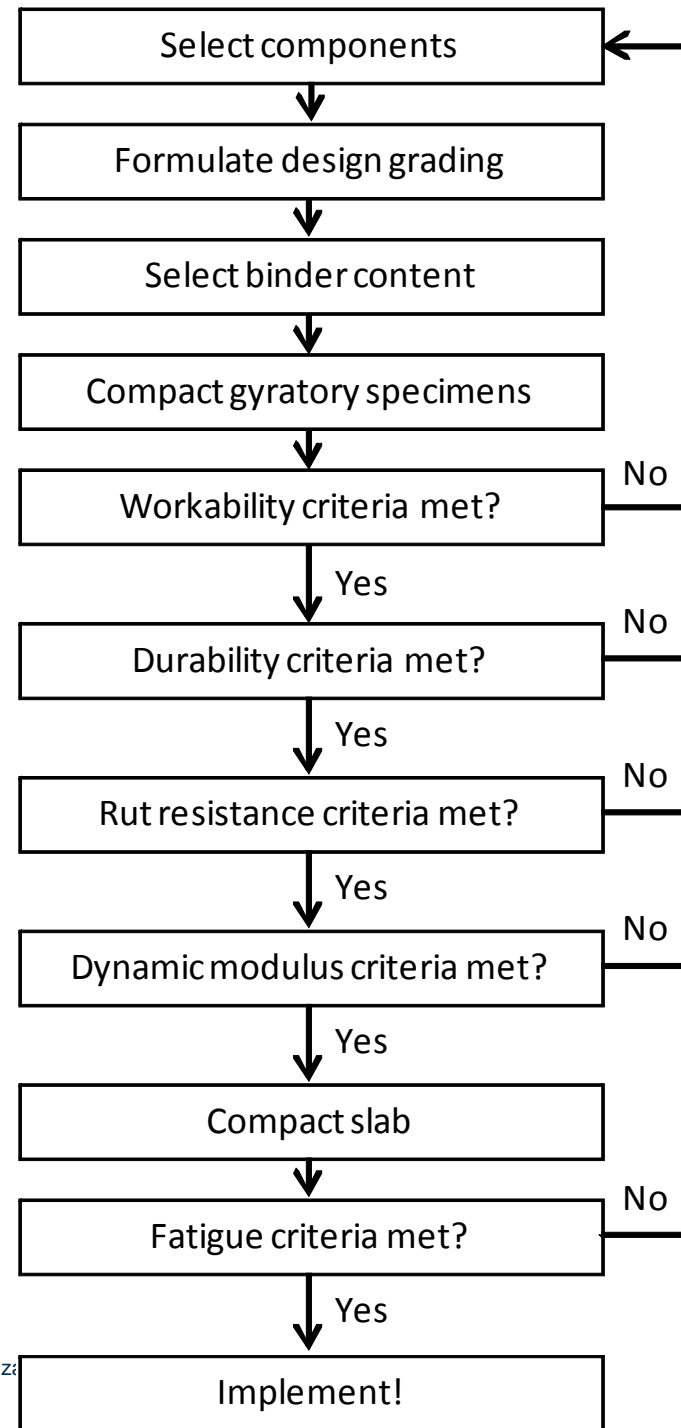
- Origin: France early 90s “*Enrobés à Module Elevé*” (*EME*)
- Typical characteristics:
 - High binder content \approx 6% by mass of aggregate,
 - Hard binder: Pen 10-25,
 - Low air voids content,
 - High Modulus $>$ 14 GPa at 15°C, 10 Hz,
 - High resistance against permanent deformation,
 - Good fatigue resistance,
 - Impermeable,
 - High mixing temperature.

sabita HiMA T² project



Performance based design process:

Development of “optimum” design grading for aggregate sources will require investment of time and money.



HiMA T² progress (since previous RPF)

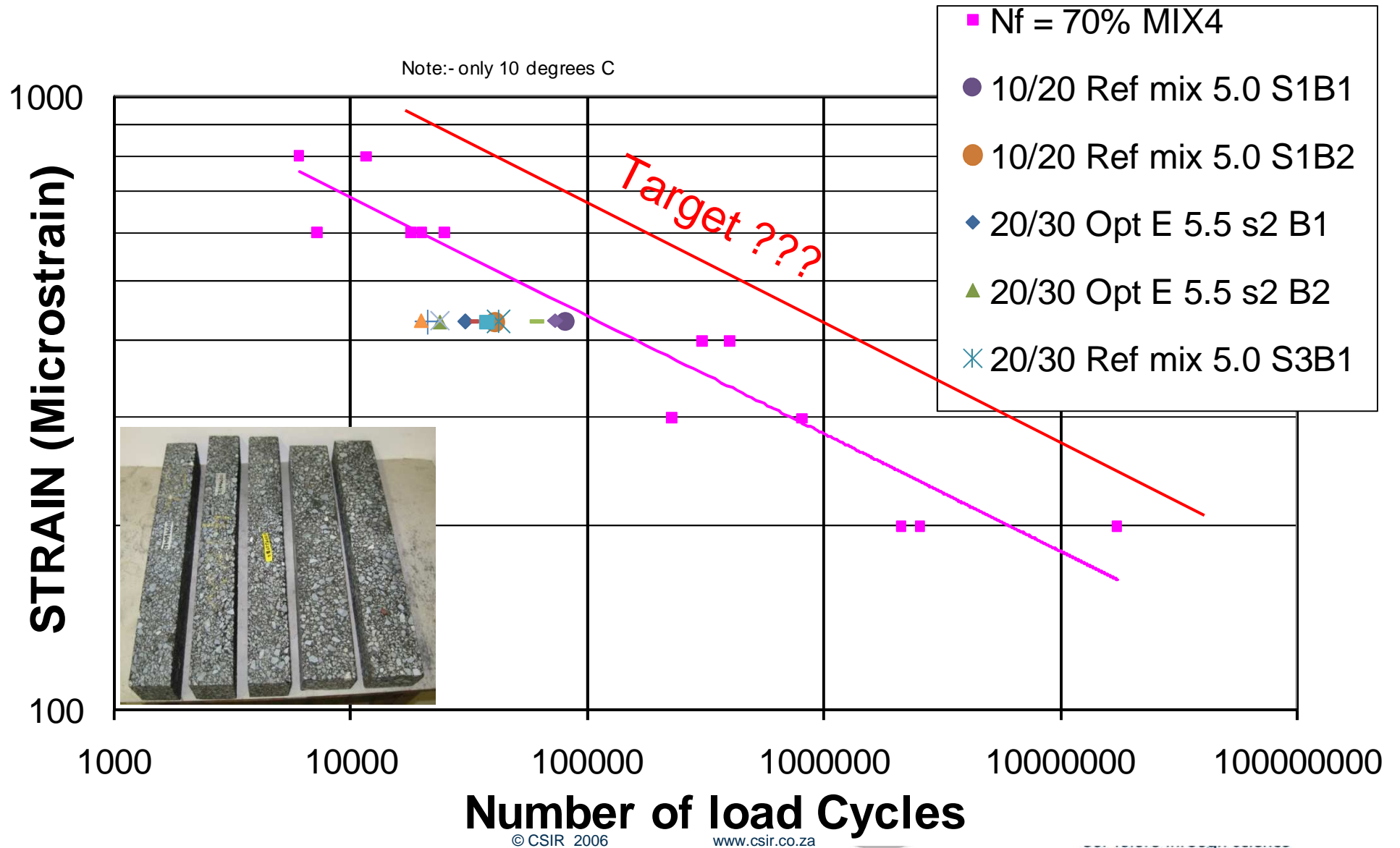
- Preliminary design guidelines updated,
- Quest for binder rich mix
- Trials with modified binder,
- 10/20 and 20/30 binder has now arrived, testing in progress,
- Mix designs including RAP are being investigated,
- Trial section paved, others planned,
- Developing mix design for APT.



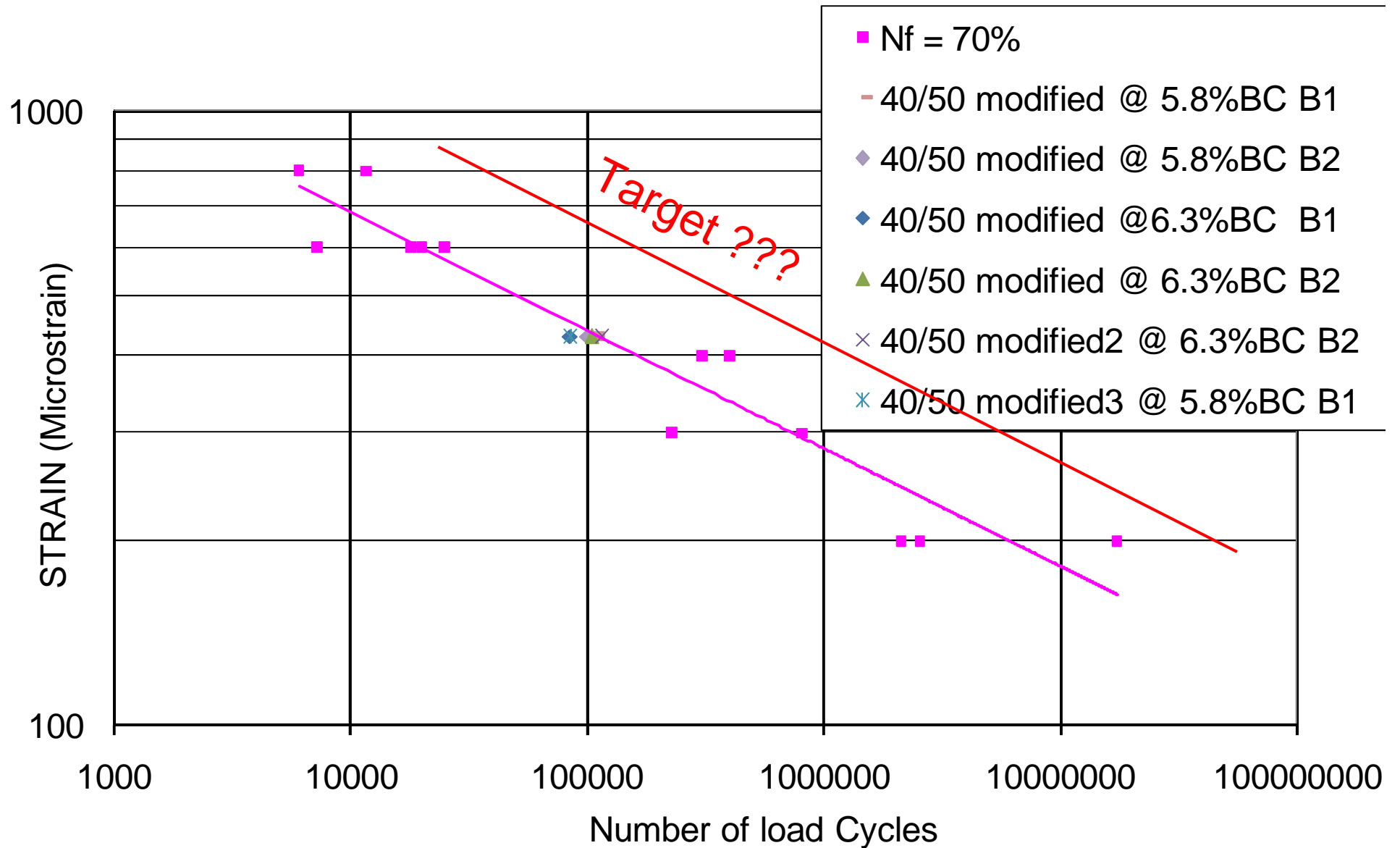
Binder properties

Test	Ref 20/30	Modified	20/30 (2011)	10/20 (2011)	15/25 Spec
Penetration (10 ⁻¹ mm)	25	29	23	22	15-25
Softening Point (°C)	62.8	64.4	57.2	62.2	55-71
Viscosity @ 60°C (Pa.s)	2713	1318	832	2375	>550
RTFOT:					
Softening Point (°C)	69.2	68.2	61.6	67.6	≥ Orig. (Min +2)
(Retained Penetration (10 ⁻¹ mm))	(19)	(20)	(18)	(16)	
% of Original	69	69	78	72.7	≥ 55

Fatigue results (10 °C 25 Hz)



Fatigue results (10 °C 25 Hz)



Way forward

- Record what was achieved and assess performance of these mixes against conventional,
- Ensure fatigue and permanent deformation criteria set to ambitious, but achievable levels,
- Compare the relative performance of different binders,
- Perform APT and LTPP,
- Gain more experience with local aggregates and binders,
- Finalize mix design and structural design guidelines and set “final criteria” once experience has been gained.



Thank you

