

Warsaw, 22 - 23 October 2025

II MIĘDZYNARODOWA KONFERENCJA

Nowoczesne nawierzchnie drogowe - recykling i dekarbonizacja

II INTERNATIONAL CONFERENCE

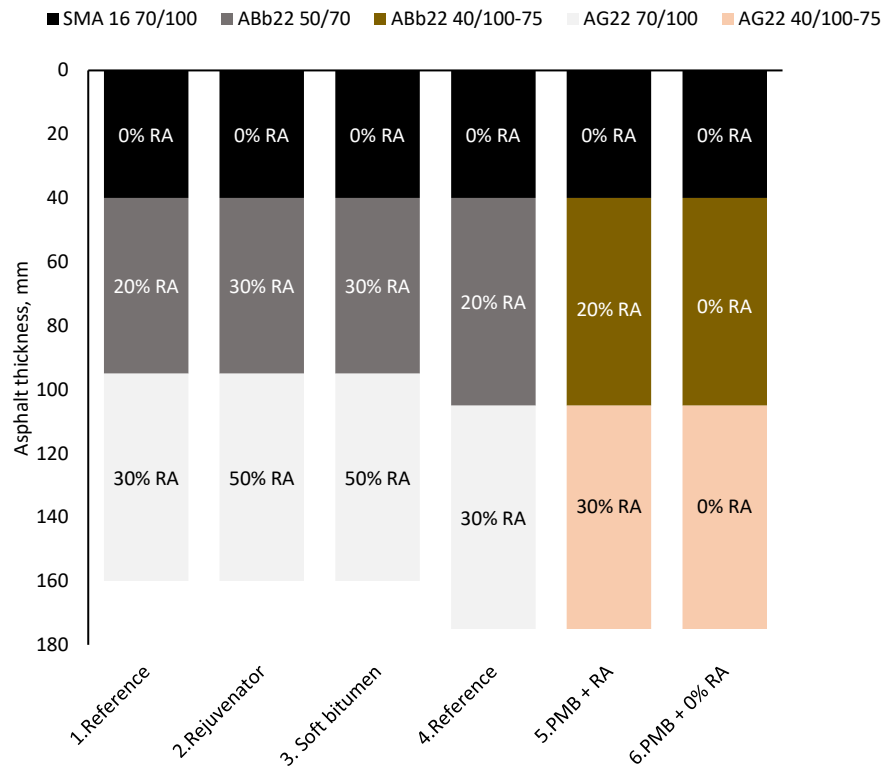
Modern road pavements - recycling and decarbonization

Follow-up of test sections with increased amount of recycled asphalt

Abubeker Ahmed, VTI

- One of the aspects that contributes to reduced CO₂ emissions is the use of reclaimed asphalt (RA).
- The Swedish Transport Administration allows higher RA content.
- The limits for the maximum content of RA have been removed for penetration-grade bitumen (as of 2018).
- Restrictions remain for PMB pavements (10%).
- Short lifespan undermines climate benefits.
- The overall aim of the project was to compare the technical properties of asphalt pavements with varying amounts of RA content.
- Six test sections built on E20 motorway.





Follow-up methods

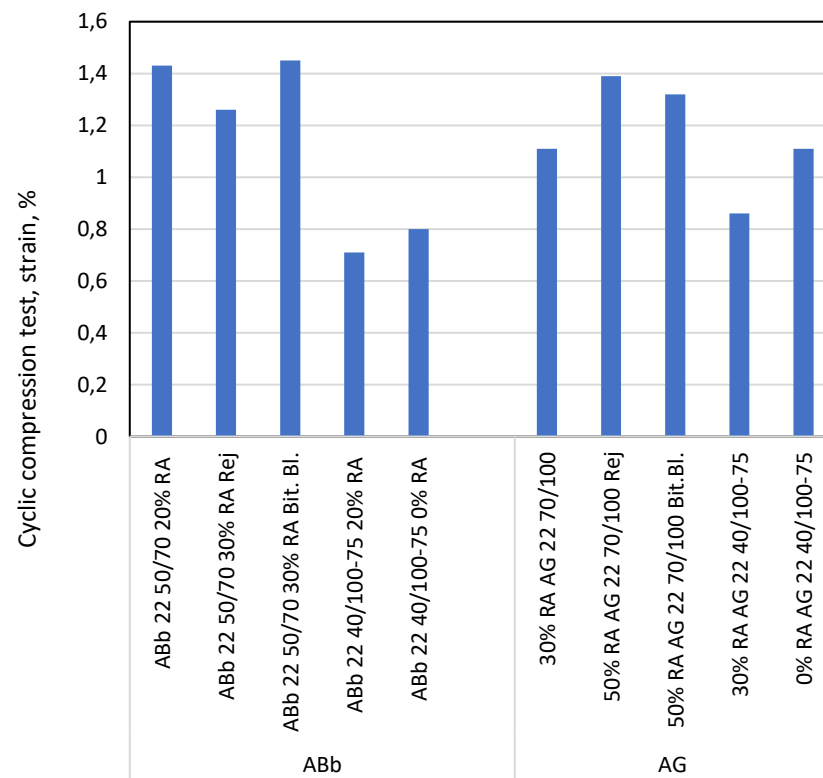
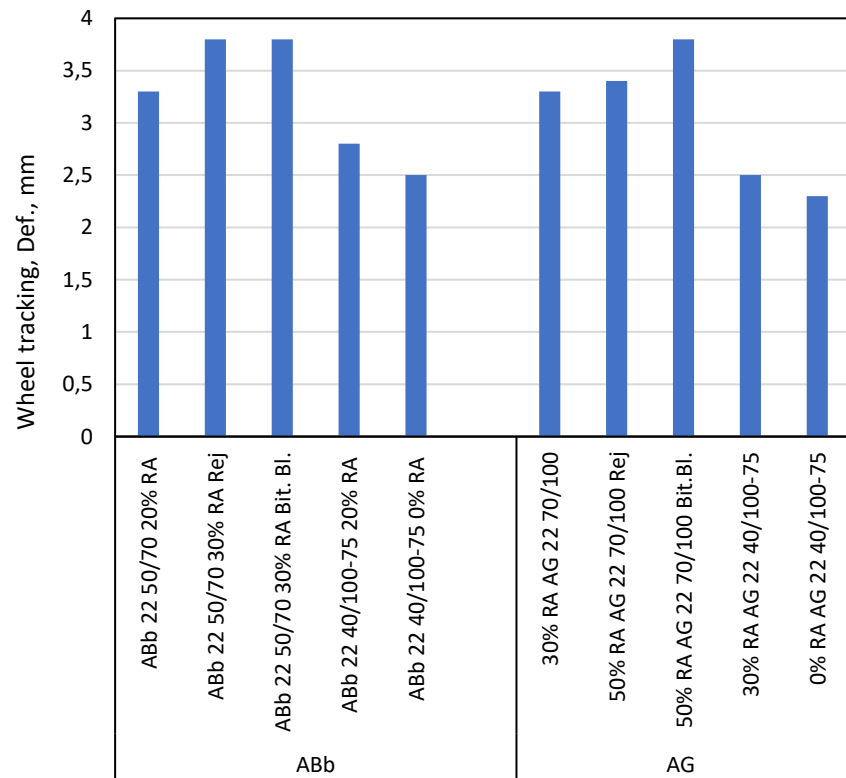
- Asphalt strain gauges
- Falling weight deflectometer (FWD)
- Profile measurements
- Visual inspections
- Laboratory tests



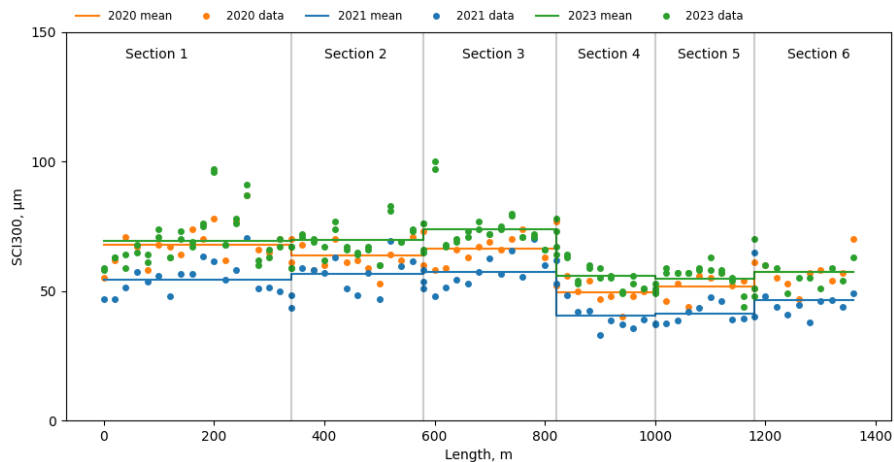
Follow-up timeline

	2019	2020	2021	2022	2023	2024
FWD	✓		✓		✓	
Traffic measurement					✓	
Asphalt strain reading	✓		✓		✓	
Profile measurement	✓		✓		✓	
Visual inspection		✓		✓		
Final report						✓

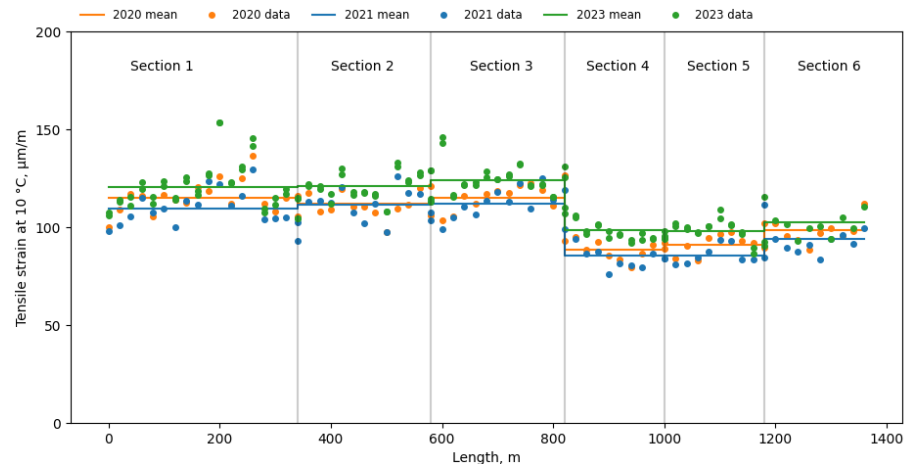
Laboratory evaluations of asphalt mixtures containing RA



SCI 300

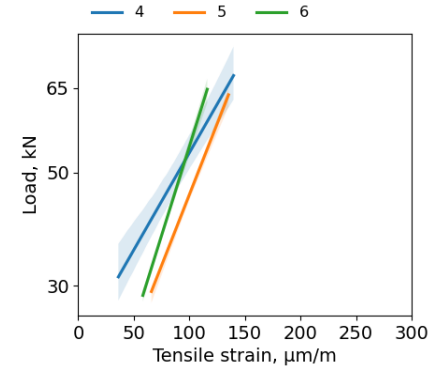
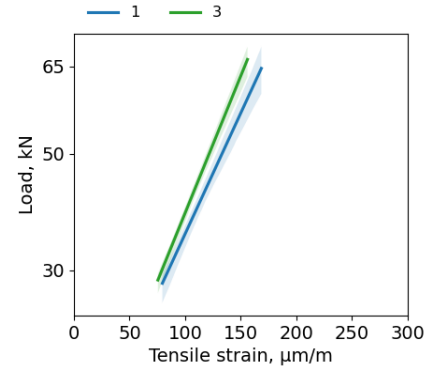
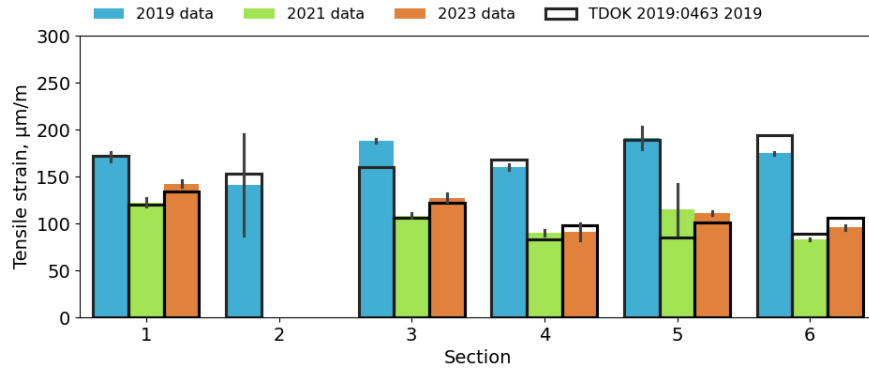


Asphalt strain at 10°C

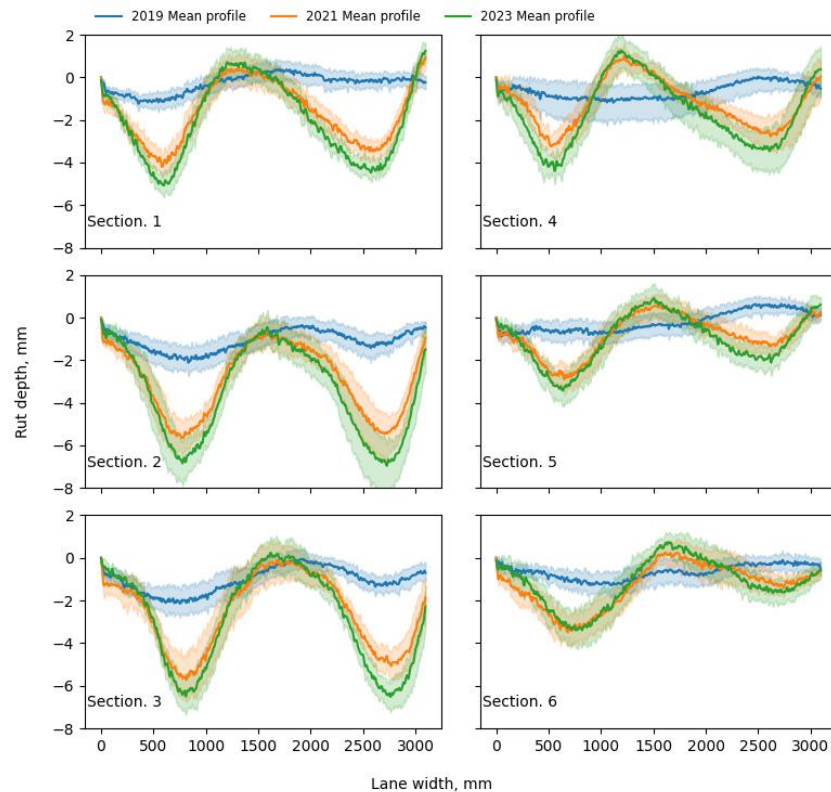
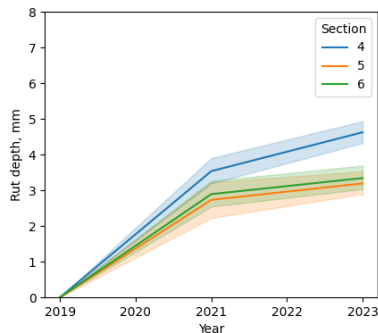
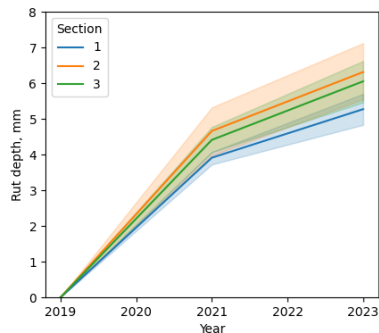


Index	Low volume roads	Medium traffic roads	High volume roads
SCI300 (μm)	280 - 400	125 - 250	75 - 125
Strain (μm/m)	380-550	200 – 350	150 - 200

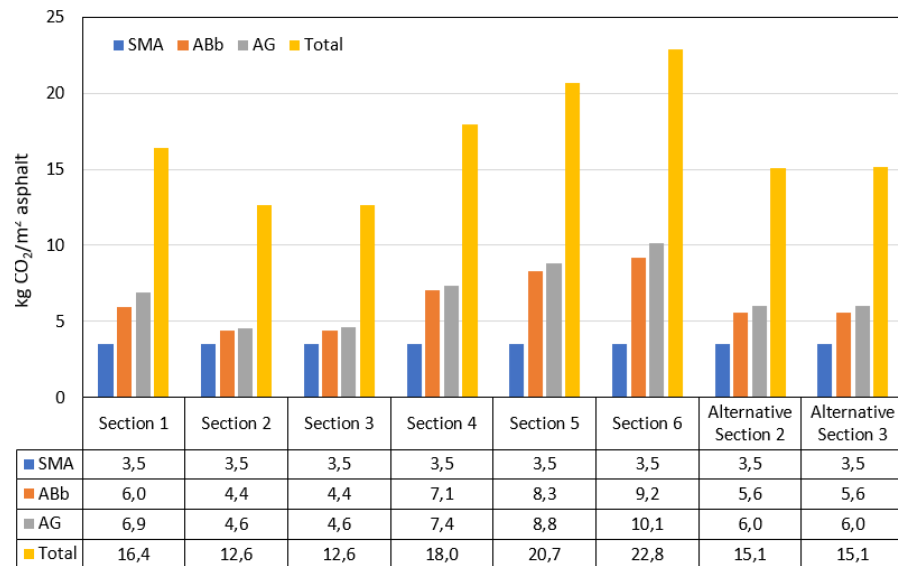
Measured and calculated asphalt strain



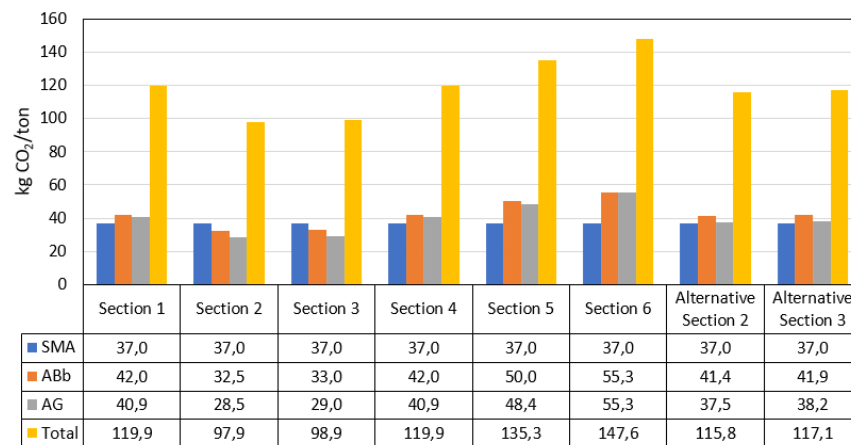
Rut depth development



Greenhouse gas emissions in kg CO₂eq per m² of pavement surface



Greenhouse gas emissions are given in kg CO₂eq per ton of asphalt mixture



After five years of monitoring the test sections, the following conclusions can be drawn:

- Increasing the recycled asphalt material, up to 50% in penetration bitumen, resulted in similar or better performance compared to as the reference sections.
- However, there is a clear tendency for the reference section to show lower rut depths compared to sections with 50% RA, and perhaps the compensation with soft bitumen and rejuvenators needs to be adjusted.
- When adding recycled asphalt up to 20% and 30% in polymer-modified asphalt mixtures for both binder and base layers, similar results were obtained as the PMB section without RA.
- This provides a basis for reviewing the current regulations where only 10% RA is accepted in PMB.
- The results show that it is important to relate climate impact calculations to the technical lifespan of the construction.

Thanks!

Contact: Abubeker Ahmed,
Ph.D., Senior Researcher
Email: abubeker.ahmed@vti.se



mrp25.ibdim.edu.pl