VTRC
Virginia Transportation Research Council

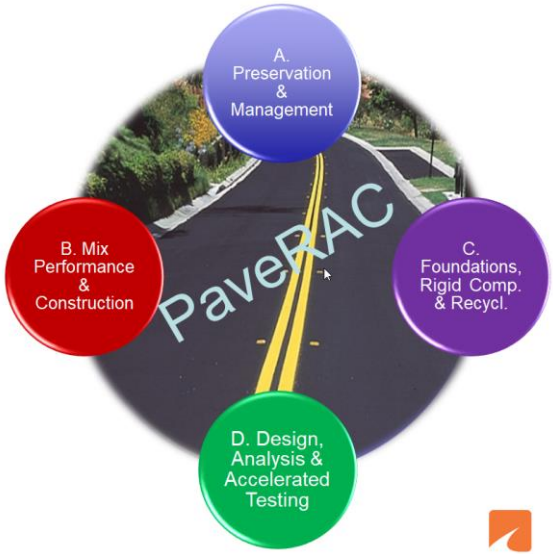
We bring innovation to transportation.

VTRC & Virginia's Asphalt Research Priorities

Hari Nair, Ph.D., P.E
Associate Director

VTRC Pavement Research Team

- 5 (+1) full time research scientists
- State of the art lab facility
- Pavement Research Advisory Committee



Asphalt Research Priorities

Hot Mix Asphalt Tonnage			
Year	2021	2022	2023
All SMA	0.30 M	0.48 M	0.28 M
Superpave Surface mixes	3.20 M	3.03 M	3.27 M
All Superpave	5.32 M	4.77 M	4.69 M
Total	5.62 M	5.25 M	4.97 M

VDOT Efforts to Increase Asphalt Pavement Performance

- Balanced Mix Design (BMD)
- Density Improvement

BMD Research Efforts

- 12 Research Projects completed
- 6 on-going research projects

  -Developing Long-Term Aging Protocol

  - Field Validation of BMD Initial Criteria

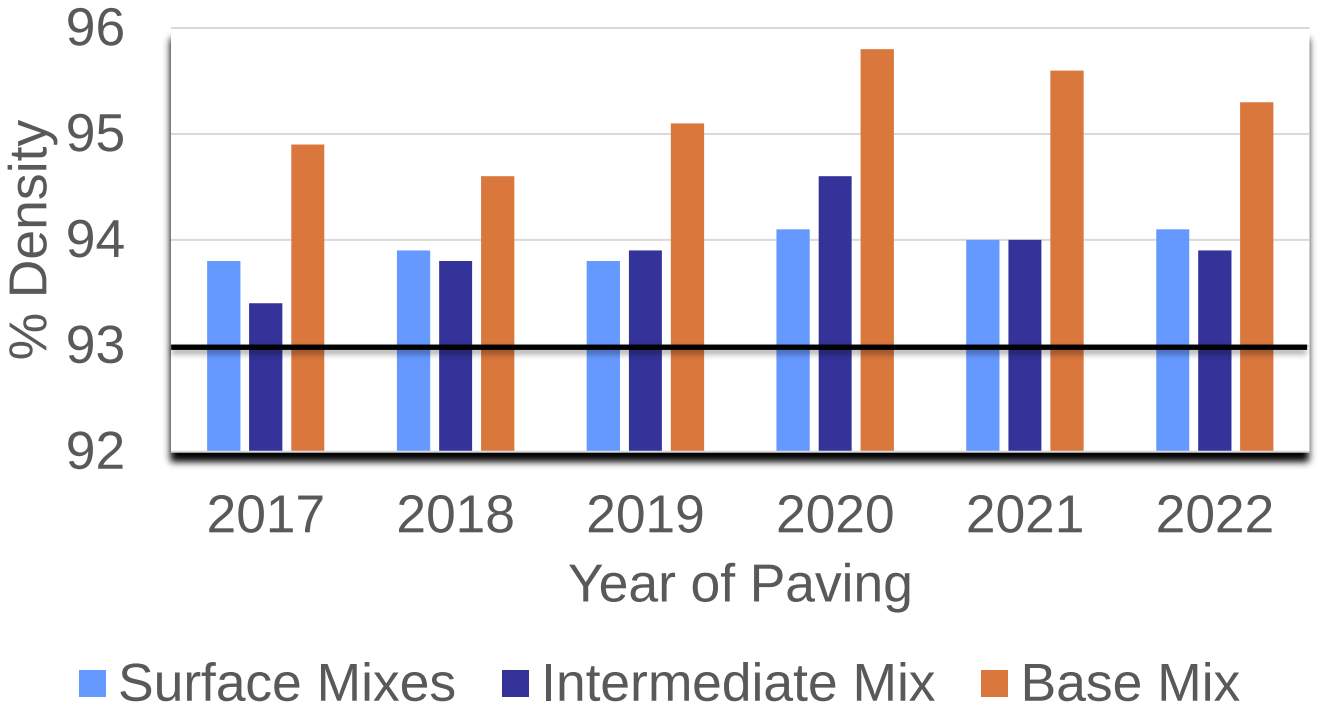
- 4 projects in planning stage

  -Documentation of 2024 BMD Implementation

  -BMD for Low-Volume Roads

Density Improvement

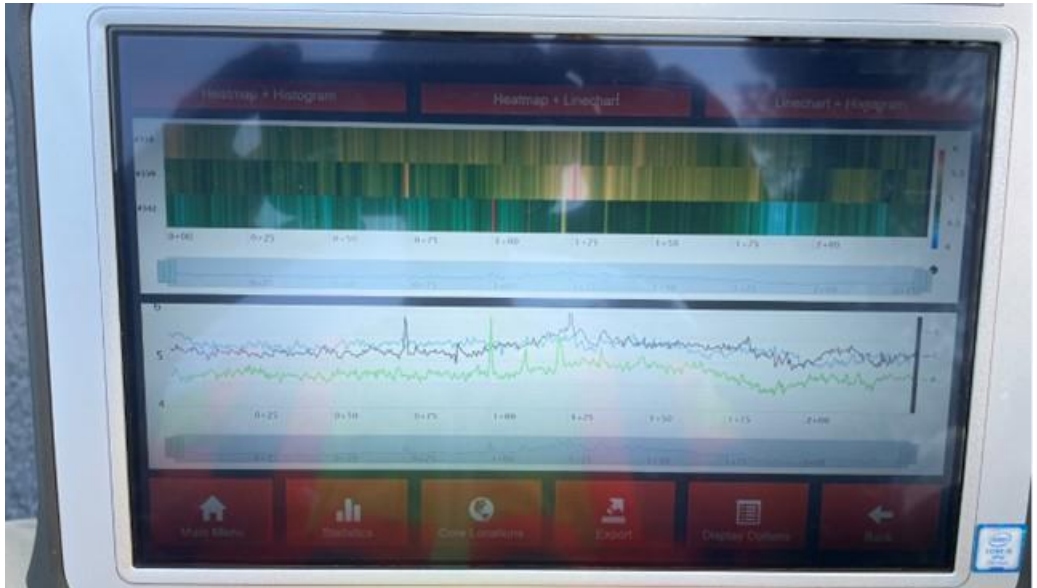
Statewide Density Averages on Superpave Mixes



Spec Limit: 92.5% minimum density for SM, IM, and BM mixes

Density Profiling System (DPS)

- Assess asphalt pavement density more continuously based on GPR (AASHTO PP 98-19)
- Assess a higher percentage of the pavement surface
- Evaluate process changes (contractor)



Pavement Preservation Research

Preservation treatments typically used in Virginia include:

- Crack sealing
- Chip seals
- Slurry seals, microsurfacing
- Cape seals
- Thin-lift hot mix asphalt overlays

Pavement Preservation Research

Microsurfacing

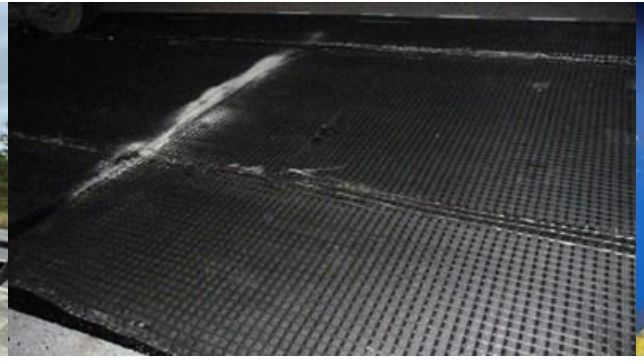
Chip Seal

Reflective Crack Mitigation Research

Virginia's Composite Pavement Network ~3000 lane miles

Reflective Crack Mitigation Strategies

- Saw and Seal
- In Place Recycling
- Interlayers
- Asphalt mixes with higher cracking resistance
- Fractured Slab Processes
- Combination Treatments
- Thicker Overlays


Binder and Mixture Modification Research

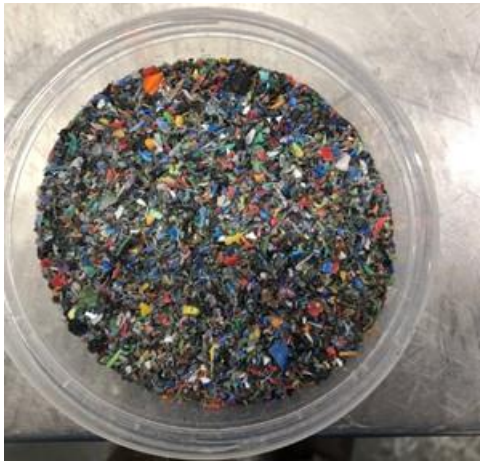
- Highly polymer modified Asphalt
- Hybrid rubber modified asphalt

- Fiber Modified Asphalt Mixture

Recycled Materials Research

Using a performance-based design approach:

- Recycled Plastics in Asphalt Mixtures
- GTR modified asphalt mixture
- High RAP mixtures with recycled agents



Thick Lift Paving

- Often done on deep patches to accelerate return to traffic
- Density and permeability vs depth
- APT experiment to assess differences in rut development

Sustainability Research

FHWA Climate Challenge

- Quantifying Greener Pavements in Virginia

- Conduct LCA case studies and develop EPD-type data

- Collect production and construction data to quantify environmental impacts

Pavement Recycling Research

FDR

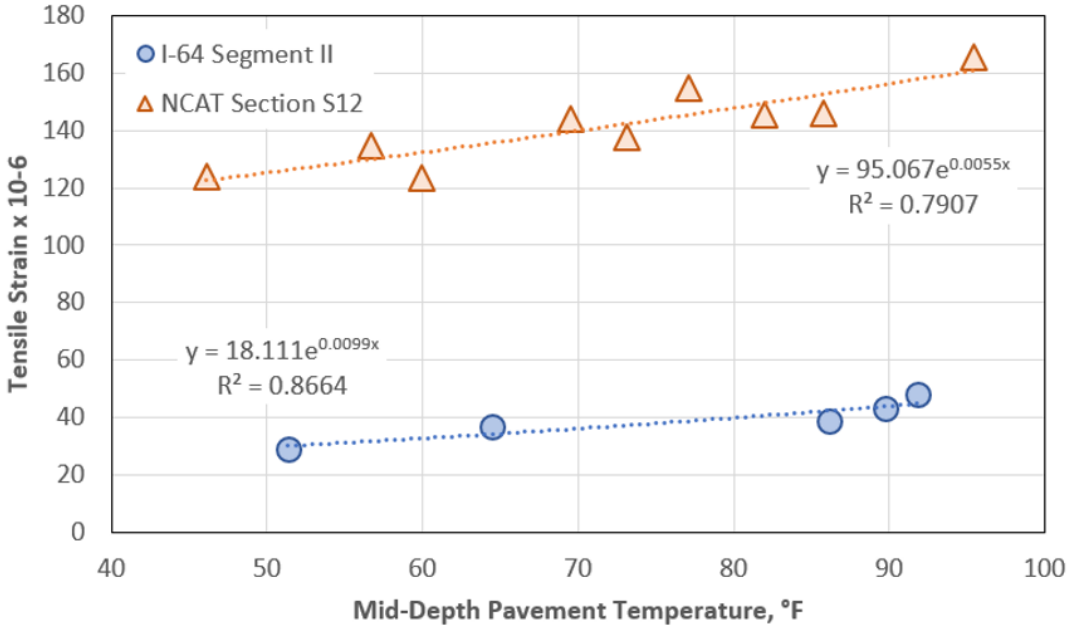
CIR/CCPR

Pavement Recycling Research

NCAT Test Sections

Pavement Recycling Research

I-64 Test Sections



Pavement Research

- Traffic Speed Deflection Devices
  -Sensors measure response to loading at (nearly) highway speeds

- Mechanistic-empirical pavement design

Other Areas

- Perpetual pavement design
- Pavement investigation
- Improving condition data for secondary/ low volume traffic routes
- Smoothness specification/ friction
- Uniformity measurement

Research Goal

Develop a research program for VDOT that will help to optimize the funding required to maintain pavements in excellent condition and to make further important advances in pavement engineering while considering the future challenges in this field.

Thanks

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