



University of  
New Hampshire



# Recycled Asphalt Shingles as a Full Depth Reclamation Mechanical Stabilizer

Fausto Bisanti, Eshan V. Dave, Jo E. Sias,  
Gabriele Tebaldi

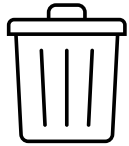
Department of Civil and Environmental  
Engineering, University of New Hampshire

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# HOW THE PROJECT WAS BORN



25,000 tons of  
waste shingles  
produced  
annually in  
Vermont



Vermont  
state law  
requires  
recycling of  
shingles



Use of RAS  
in road  
construction  
(Hot Mix  
Asphalt)



Use of RAS  
in Full-Depth  
Reclamation  
(FDR)



VTrans Project

Investigators: Fausto  
Bisanti, Eshan V. Dave, Jo  
E. Sias, Gabriele Tebaldi  
AOT Contacts: Callie  
Ewald, Ian Anderson

Funding: \$135,898

# RAS as a FDR Mechanical Stabilizer

## RAS

Composed by:

- Asphalt binder (25-30%)
- Aggregate (40-60%)
- Fiber (3-12%)

## FDR

Rehabilitation of flexible pavements (cost and environmental benefits)

- Pulverization
- Stabilization (mechanical, chemical, bituminous)
- Shaping
- Compaction

## RAS in FDR

## BENEFITS

- Waste reduction (landfill)
- Resource Conservation
- Energy savings
- Greenhouse gas emissions reduction
- Improve rutting resistance (high stiffness and viscosity)

## CHALLENGES

- Environmental impact (PAHs, SOAs, Asbestos)
- Lower cracking resistance (asphalt binder stiff and brittle)
- Resizing is necessary
- Find the “optimal” RAS content

# Research Approach

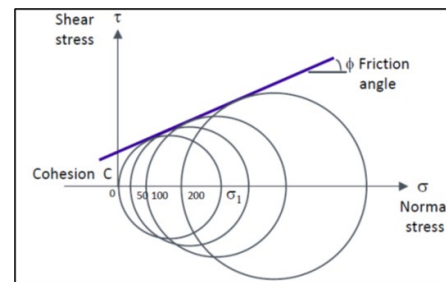
State of the art and practice review

Experimental design & materials selection

Laboratory characterization

Data analysis

Developing recommendations







**Thank you for  
the attention!**



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**VERMONT**

**AGENCY OF TRANSPORTATION  
RESEARCH PROGRAM**