

Need for road pavement recycling = Need for research

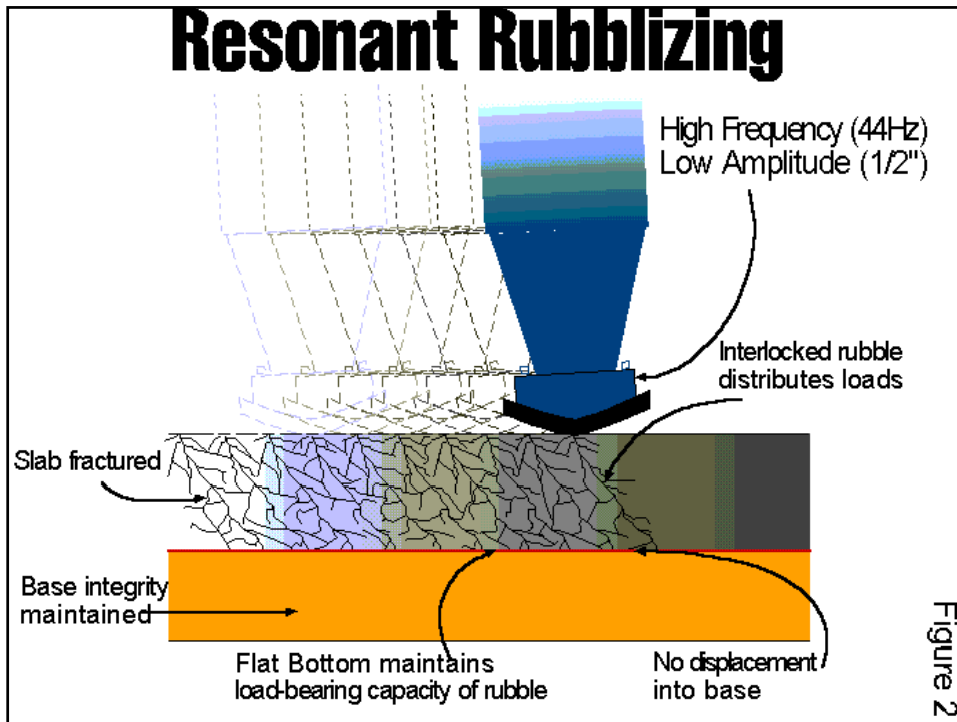
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Variability of recycling

- Cement concrete pavements
 - Rubblizing
 - Base course
- New asphalt pavement
- New cement concrete pavement







Multihead
hammer





Variability of recycling

- Asphalt pavements
 - Flexible
 - Semi-rigid
 - Hot recycling
 - Surface courses (wearing and binder courses)
 - Cold recycling
 - Base courses
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Variability of recycling

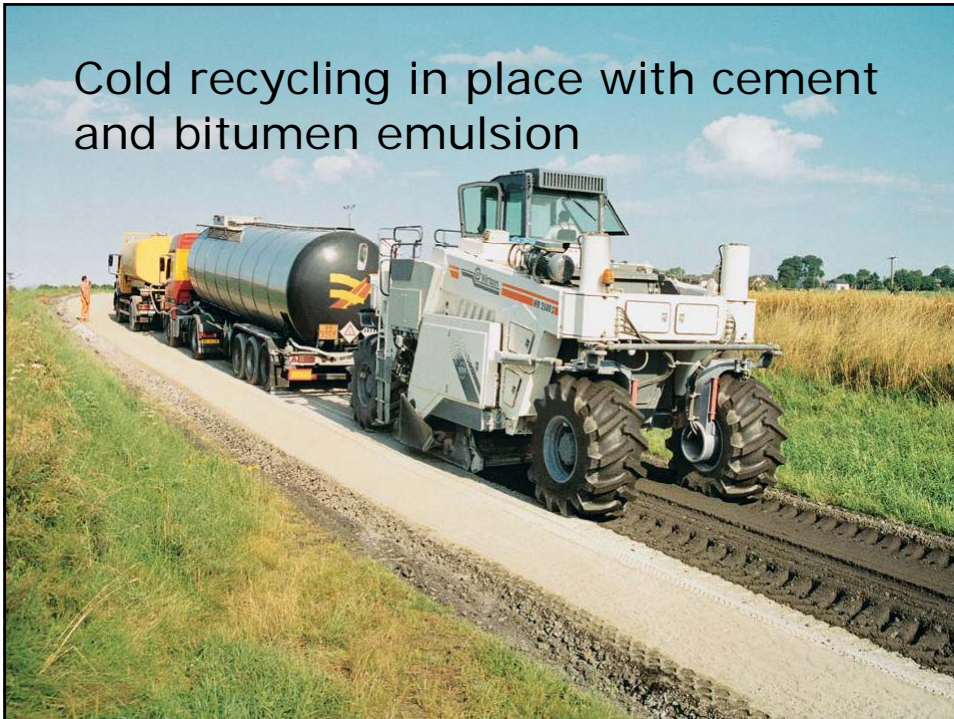
- Hot or cold
 - In place or in plant
 - Additives:
 - Bitumen
 - Emulsion
 - Foam bitumen
 - Cement
 - Aggregate
 - Variability of recycling = Opportunity for design of material and pavement properties
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Cold recycling in place with cement



Cold recycling in place with cement and bitumen emulsion



Cold recycling in place with foam bitumen







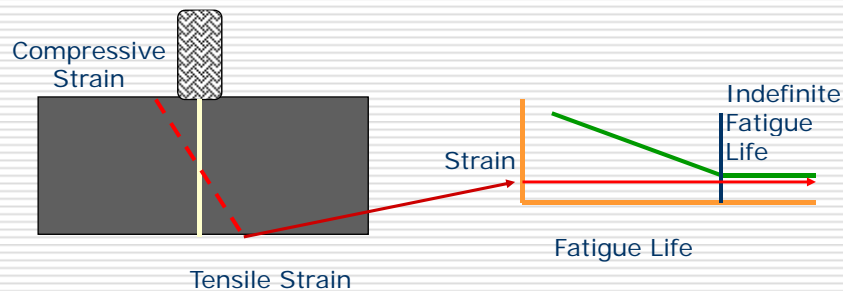
Opportunity for design of material and pavement properties

- Performance-based (related) properties
 - Stiffness
 - Fatigue characteristics
 - Permanent deformation resistance
 - Water resistance
 - Cracking resistance
- Opportunity for Long Life pavement design



Long Life Pavement concept

- Stiffer asphalt base of longer fatigue life
- Lower strain – longer pavement fatigue life
- Indefinite Fatigue Life



Need for research

- New or recycled – the same performance-based test methods and requirements
 - Material design
 - Pavement design
 - Limitations for recycling?
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