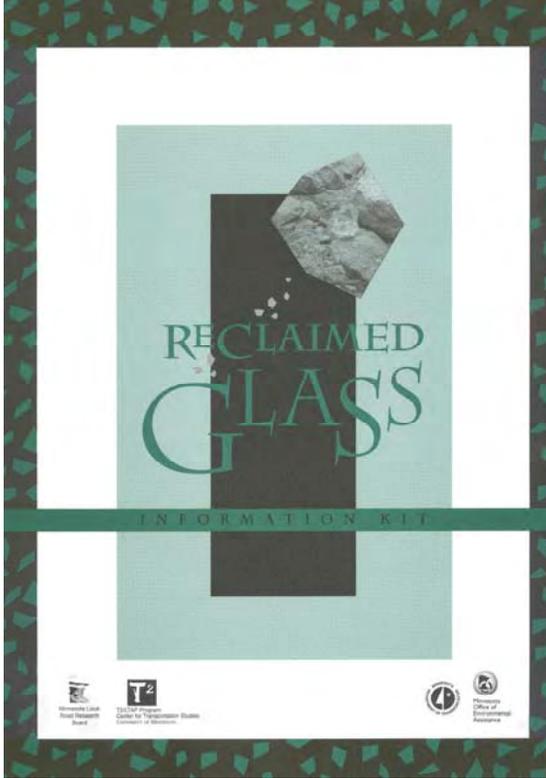


Minnesota's Experience in Implementing the Use of Shingles

- Roger Olson
- Research Operations Engineer
- Minnesota Dept. of Transportation

HMA Recycling

- Initially 70% Recycled Asphalt Pavement (RAP)
- 60% 1983
- 50% Base, 30% Wear 1995
- Currently
 - 20% to 40% RAP
 - QA/QC criteria



Glass

- Class 7 allows glass proactively
(Engineer would need to write it out)
- Glass supply is non-uniform
- Tool Kit

Aggregate Base Class 7 Specification

Class 5 specification for aggregate base.

Specification developed to identify recycled materials in aggregate base.

Crushed Concrete, RAP identified

Up to 10 percent by weight reclaimed material (glass).



SHINGLES

Shingles - History

- Mn/DOT tests
(with University of Minnesota)
- Willard Munger Trail (1990)
- Hwy 25 south of Mayer, MN (1991)
- Scott County Hwy 17 south of Shakopee, MN (1991)

TH 25 Test Section



Test Results

	% Shingles	PG GRADE
TH25	0	73-20
TH 25	5	75-20
TH25	7	79-15
CSAH 17	0	77-22
CSAH 17	10	75-24

Shingle Processing

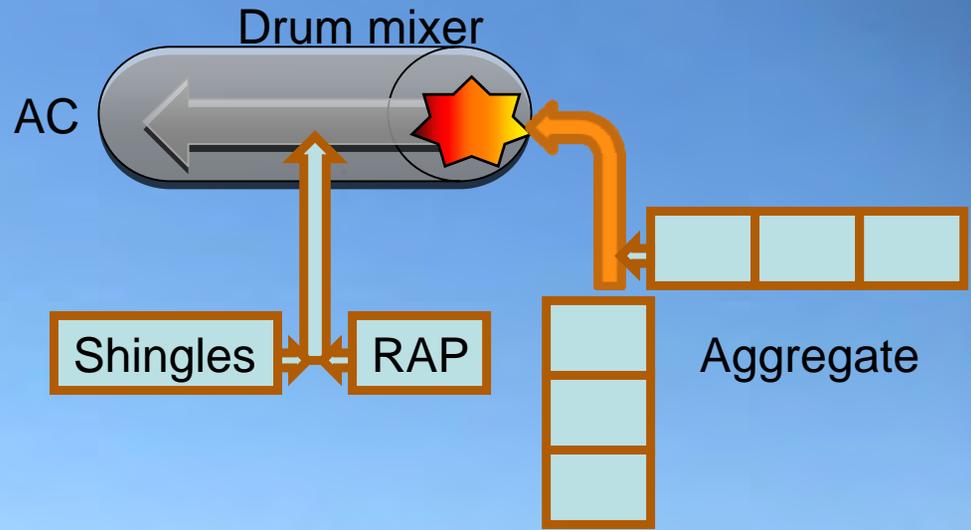
- Can be added like recycled asphalt pavement
- Steps include: grinding, sizing and grading
- Contaminants must be removed
- Certification of supply required
- Manufactured waste only



Shingles, used as RAP additive₁₀

Shingles - Implementation

- Mn/DOT specifications 2331.3E2e and 2360 now allows 5% shingles in hot mix
- Shingles considered as RAP
- Inclusive in the percentage allowed
- Approval now passive



Crushed shingles in a hopper



Shingles



Types of shingle scrap

- Manufactured asphalt shingle scrap
- Hot Mix Asphalt
- Basically all MASS is currently being recycled

- Tear-off scrap shingles
- Early Demos: LAT/Ramsey Co , Hassan TWP
- Planned: Mn/ROAD, Hennepin Co.

Shingle Implementation

- Continue Research under Research Grant from Mn/PCA (\$50,000)
- Participate in SPR Pooled fund Study lead State Missouri and Dr. Chris Williams, Iowa State the P. I.
- Track projects

Shingle Implementation What's Next

- Phase One: Research, Development and Field Demonstrations
- Phase Two: Market Development Project
- Phase Three: Field Demonstration and Technology Transfer-Tear Off Shingles

Little Known History Fact....

Give me your tires, your shingles, your broken glass yearning to be used freely, the wretched refuse of your buldging land fills. Send this tireless refuse to me. Lift your shovel of ash beside the incinerator door....

