

# New Hampshire's Recycled HMA Specification

**Denis M. Boisvert, P.E., NHDOT Chief of Materials Technology**



April 23, 2009

HMA Recycling ETC Meeting

1

# Problems

- RAP AC content is highly variable by source, ranging from 3% to 6% statewide.
- Poor control of recycled binder quantities in new HMA.
- Previous specification is silent on use of recycled asphalt shingles (RAS).

# Motivation

- Conservation of resources and funds.
- Allow use of roofing shingles.
- Roadmap for contractors to invest in needed technologies to increase RAP use.
- FHWA promotion of increased RAP use.

# Benefits of Spec. Changes

- Increase in allowed RAP quantities before binder testing is required.
- Elimination of separate “known” and “unknown” source stockpiles.
- Introduction of Recycled Asphalt Shingle products for HMA use (must be a Department-approved manufacturing process).
- Replacement of “percent RAP” metric with “total reused binder” (TRB).

# TRB Mix Design Criteria

- Three total reused binder quantity ranges
- Increasing test requirements as TRB increases
- Addresses RAP, RAS product and combined RAP/RAS mixtures

# TRB Mix Design Criteria

Max. % RAP Binder	Max % RAS Product Binder	Max Combined % TRB	Application Requirements
0.8*	0.6	0-0.8*	a. RAP-only mixes: Virgin binder grade as specified.
			b. Mixes containing RAS product: Composite binder must meet specified PG grade. Verify design compliance by testing split samples.
			c. Test RAP & RAS product stockpiles for gradation and AC% every 1,000 & 500 tons, respectively.

\* Equivalent to 20% RAP at 4% AC.

# TRB Mix Design Criteria

Max. % RAP Binder	Max % RAS Product Binder	Max Combined % TRB	Application Requirements
1.0*	0.6	>0.8-1.0*	a. Mixes containing RAS product: Split sample testing of composite binder to verify compliance of design with specified PG grade.
			b. Test RAP & RAS product stockpiles for gradation and AC% every 1,000 & 500 tons, respectively.
			<b>c. RAP-only mixes: Reduce specified virgin binder one PG grade unless determined to be unnecessary.</b>

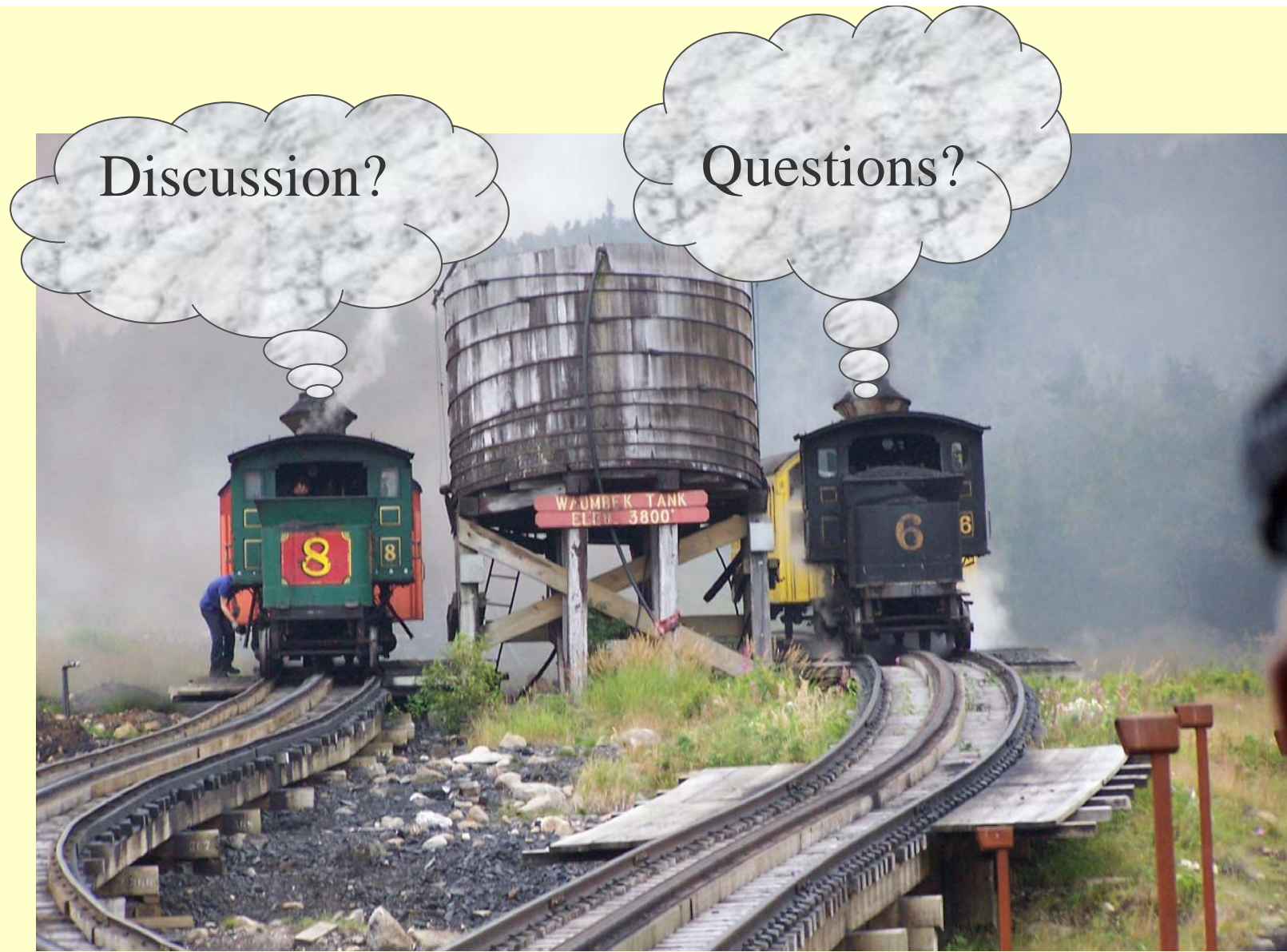
\* Equivalent to 25% RAP at 4% AC.

# TRB Mix Design Criteria

Max. % RAP Binder	Max % RAS Product Binder	Max Combined % TRB	Application Requirements
1.5*	0.6	>1.0-1.5*	<p>a. <b>All composite binder</b> must meet specified PG grade. Split sample testing to verify compliance of design.</p> <p>b. Test RAP &amp; RAS product for gradation and AC% every 1,000 &amp; 500 tons, respectively.</p> <p><b>c. Only allowed for base &amp; binder courses.</b></p> <p><b>d. Cover RAP stockpiles.</b></p> <p><b>e. Only allowed in a drum plant.</b></p> <p><b>f. Run split samples at start of production, and every 10,000 tons for composite binder testing.</b></p>

\* Equivalent to 37.5% RAP at 4% AC.





Contact: Denis M. Boisvert (603) 271-3151, [dboisvert@dot.state.nh.us](mailto:dboisvert@dot.state.nh.us)

April 23, 2009

HMA Recycling ETC Meeting

9