

7th Asphalt Shingle Recycling Forum Chicago, IL



Catherine Batey
Division Administrator, FHWA-IL
RAS Overview
October 29, 2015



Why Use Recycled Asphalt?

- Reduce first cost
- Avoid landfill



2006 FHWA Recycled Materials Policy---

“...recycled materials should get first consideration in materials selection ...” and “shall not adversely affect the performance, safety or the environment of the highway system.”

<http://www.fhwa.dot.gov/pgc/results.cfm?id=5614>

Sources of Recycled Asphalt

Reclaimed Asphalt Pavement (RAP)

- 5 % asphalt binder
- 95 % well graded aggregate

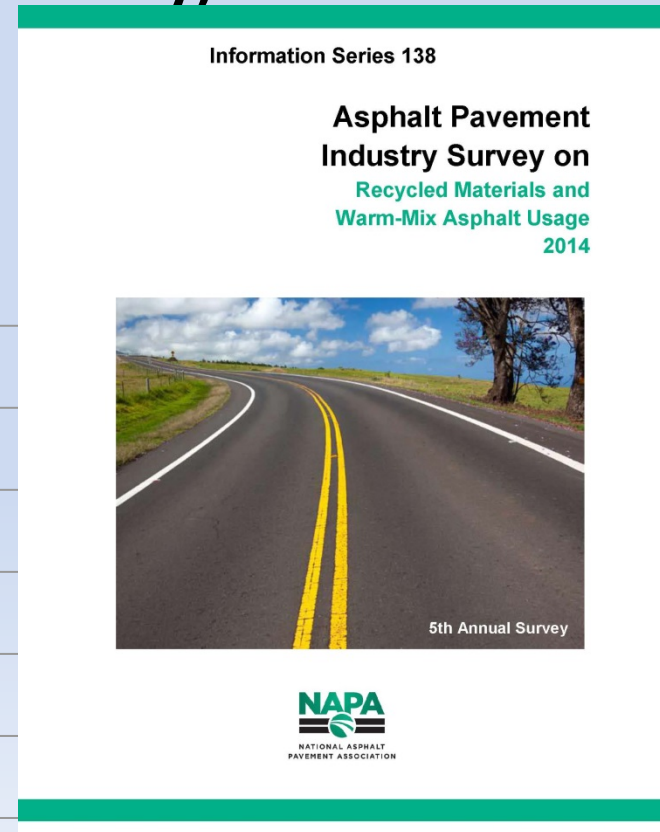
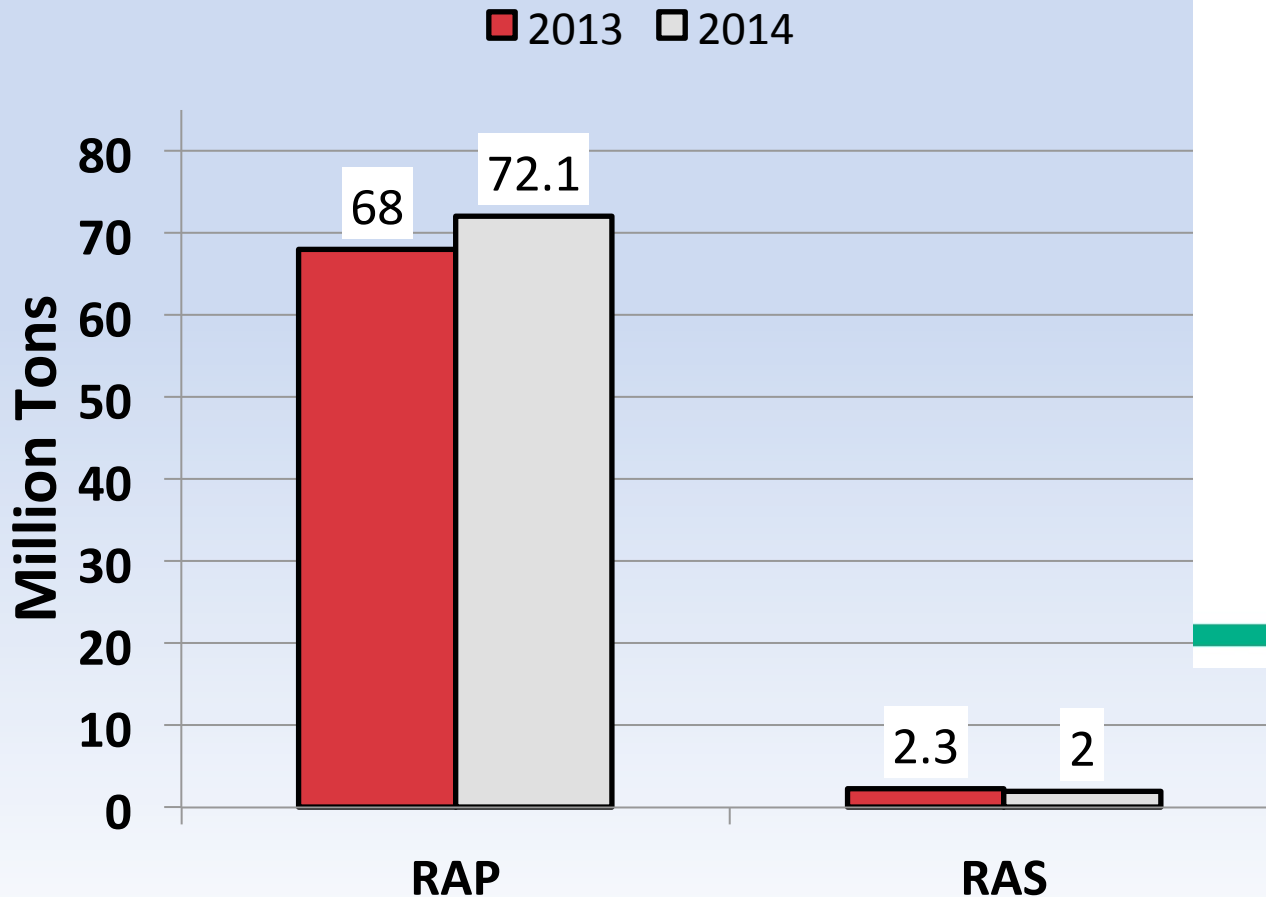


Recycled Asphalt Shingles (RAS)

- 20 % hard asphalt binder
- 75 % fine aggregate
- 5 % fiber
- Manufacturer waste
- Old roofs (tear offs)



2014 Quantities (Preliminary)



352 Million Tons
HMA/WMA

How Does RAS Impact Performance?

- Binder in RAS is much stiffer
- Many unknowns (binder availability, aging)
- Potential for premature cracking
- Problems reported across the country
- No existing test method

We Don't Know!

AASHTO Specifications

- MP 23-14 Reclaimed Asphalt Shingles (RAS) for Use in Asphalt Mixtures
- PP 78-14 Design Considerations When Using Reclaimed Asphalt Shingles (RAS) in Asphalt Mixtures
- M 323-13 Superpave Volumetric Mix Design

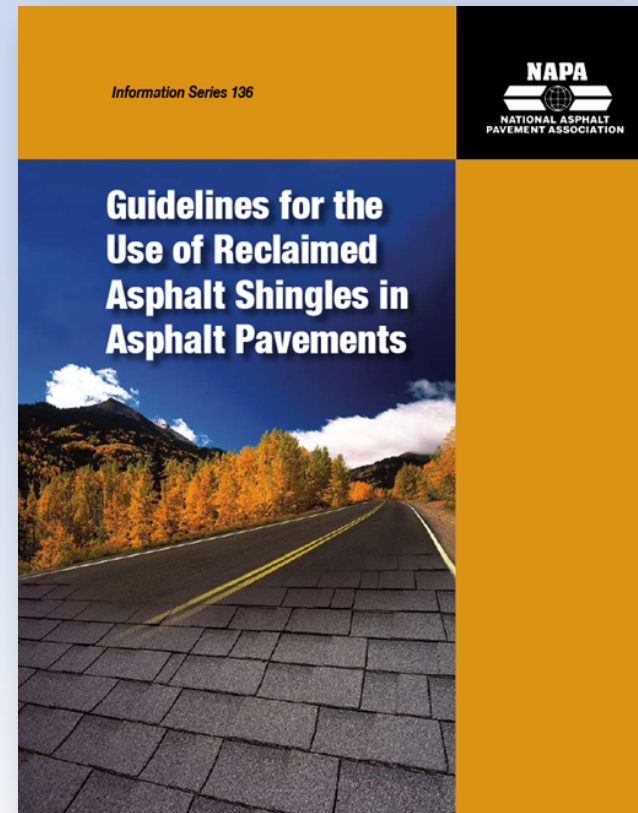


Reclaimed Asphalt Shingles (RAS) Industry Guidance

CMRA



NAPA



Construction Materials Recycling Association (CMRA)

FHWA RAS/RAP Guidance

Memorandum to Division Offices

- *10-20-2014: “Recycled Materials in Asphalt Pavements”*
Recommendation: State highway agencies using or creating specifications for RAP/RAS should keep aware of changes in AASHTO standards. Obviously past performance is also an important consideration.

<http://www.fhwa.dot.gov/pgc/results.cfm?id=5613>

- *12-11-2014: “Recycled Asphalt Shingles Used in Asphalt Pavement”* - Where there are performance concerns with the use of RAS as evidenced through premature pavement failures, to require the use of provisional standard PP 78-14 as a minimum for Federal-aid participation.

<http://www.fhwa.dot.gov/pgc/results.cfm?id=5614>

Recent Studies

- *NCHRP 9-55: Recycled Asphalt Shingles in Asphalt Mixtures with Warm Mix Asphalt Technologies*
- *NCHRP 9-58: The Effects of Recycling Agents on Asphalt Mixtures with High RAS and RAP Binder Ratios*
- *NCHRP Synthesis Topic 46-05, “Use of Reclaimed Asphalt Pavement and Recycled Asphalt Shingles in Asphalt Mixture*
- *FHWA Accelerated Load Facility (ALF) Experiment*
- *Pooled Fund 5(294) Design & Analysis for Asphalt Mixtures Containing High RAP/RAS*
- *Revision of NAPA publication IS 136: Guidelines for the Use of Recycled Asphalt Shingles in Asphalt Pavements*

Illinois DOT-Sponsored Research

- *Testing Protocols to Ensure Performance of High Asphalt Binder Replacement Mixes Using RAP & RAS (12/2015)*
- *Chemical and Compositional Characterization of Recycled Binders (3/2016)*
- *Construction and Performance Monitoring of Various Asphalt Mixes (9/2017)*
- *Thermodynamics Between RAP/RAS and Virgin Aggregates During Asphalt Concrete Production – Literature Review (Completed)*
- *Additional work to correlate new cracking test with results from TFHRC Accelerated Loading Facility sections*
- *MnROAD/NCAT Pooled Fund Study – Cracking Test Validation Experiment*

Thank You

