

MICHIGAN PEER REVIEW

Audrey Copeland

March 30, 2016
Kalamazoo, MI



My Approach

- **Goals:**
 - - Benchmark MDOT practices against national best practices
 - - Offer suggestions to the questions posed for focus topics
 - - Offer suggestions for changes aimed at improving pavement performance
- **Surveys conducted among 38 State Asphalt Pavement Associations**
- **NAPA's Pavement Performance task group**
- **Useful resources from national organizations including NAPA, NCAT, TRB NCHRP, AASHTO and FHWA**

General Observations & Priorities

- Separate RAP & RAS Specifications and Increase RAP Allowed
- Consider reducing number of binder grades
- Implement mix verification best practices & encourage local agencies
- Local agencies follow fundamental and best practices for quality and in a timely manner
 - Local agencies should consider RAP use for cost savings
- Continue use of incentives & performance expectations along with contractors' options to use technologies

Michigan RAS Usage & Recommendations

- MDOT's limit of 17% binder replacement for RAS is appropriate
- Permissive specification that allows limited RAS use
- RAS should be treated differently than RAP
- Consider specifying RAS binder availability between 0.7 & 0.85 – follow AASHTO PP78 guidelines & FHWA Asphalt ETG recommendations

***Where to find
the latest
survey report:***

Information Series 138

**Asphalt Pavement
Industry Survey on
Recycled Materials and
Warm-Mix Asphalt Usage
2014**



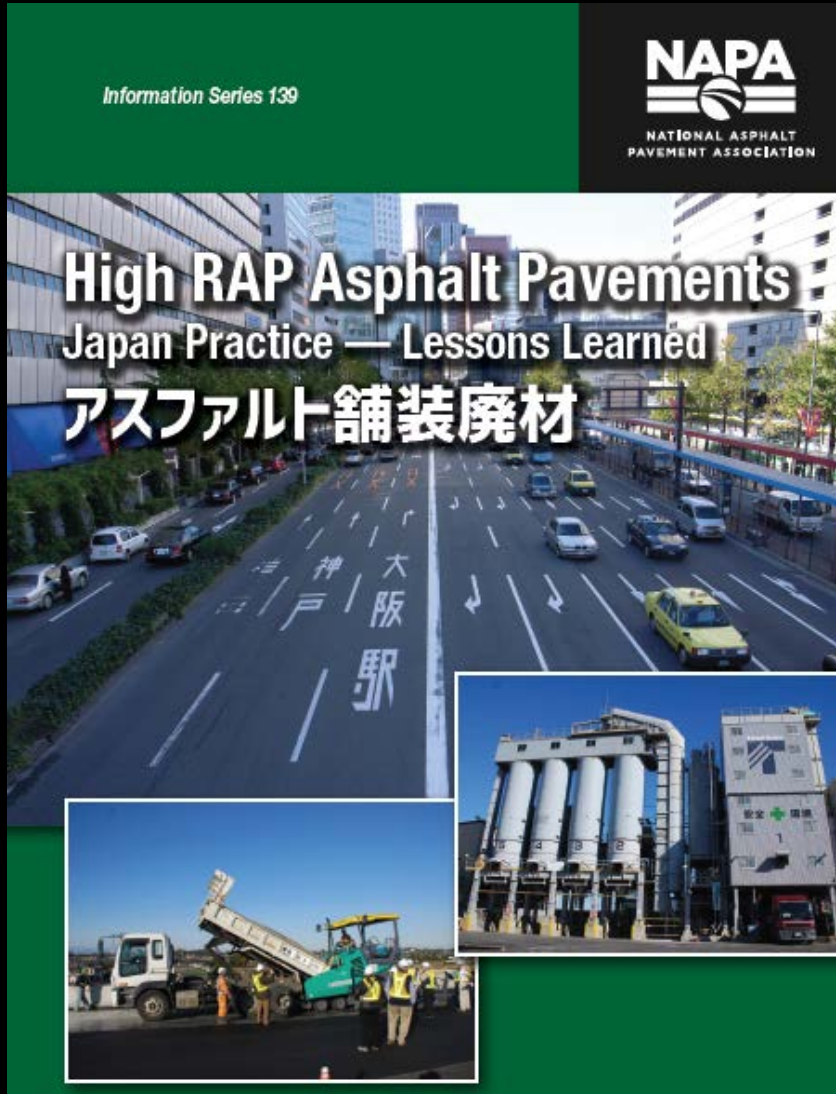
www.asphaltpavement.org/recycling

New Publications

Information Series 139

NAPA
NATIONAL ASPHALT
PAVEMENT ASSOCIATION

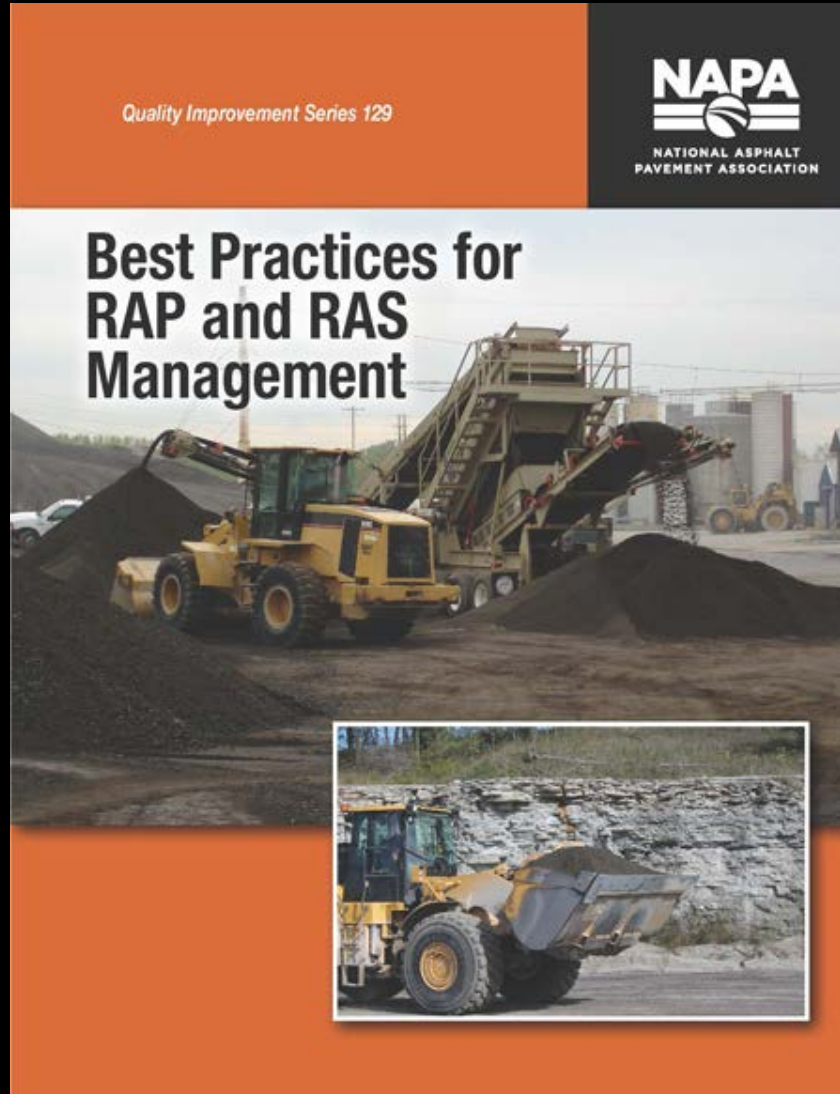
High RAP Asphalt Pavements Japan Practice — Lessons Learned アスファルト舗装廃材



Quality Improvement Series 129

NAPA
NATIONAL ASPHALT
PAVEMENT ASSOCIATION

Best Practices for RAP and RAS Management



Pavement Performance & Quality

The Issues	The Strategy	The Focus
<p>Long-term funding and lack of proper funding for preservation and maintenance</p> <p>Possible dry mixtures with low asphalt content</p> <p>Construction practices, lack of inspection, and need for training.</p>	<p>Pavement Performance Task Group</p> <p>Issues and Industry Strategies</p> <p>Partnerships</p> <p>Recommendations for Ensuring Durability</p>	<p>Refocused Engineering Committee</p> <p>Focus on Durability in Partnership with FHWA & SAPAs</p> <p>Rethinking Asphalt Mixture Design & Simplifying Specifications</p> <p>TRB Workshop NAPA Workshop FHWA Task Group</p>

Where is MDOT/APAM leading?

- Minimum thickness of asphalt layer corresponds to NMAAS – MDOT follows 4x for all mixes
- Consider fine-graded (smaller NMAAS) mixture for reduced permeability and easier compaction to achieve density
- SMA and Thin Overlays (4.75 mm mixtures)
- Increasing effective asphalt content
 - $VMA = \text{Air Voids} + \text{Effective Volume of Asphalt}$; consider changing target air voids which will result in asphalt content changes (essentially what MDOT is doing during regression)
- High RAP, greater than 25% RAP binder ratio, use softer binder

Considerations for the Future

- Rethinking mix design to be balanced, performance-based
- Aggregate Bulk Specific Gravity
 - Run and check frequently, mix designs should report values
 - RAP G_{sb}
- Simplify number of gyration levels to 3 or less while lowering N_{design} - consider VMA and gradation
- According to a SAPA survey, the following states use in place density determined by correlated nuclear gauge: MN, CO, OH, KS, NY, & VA.
- The NAPA Pavement Performance task group has made the following recommendations:
 - Greater frequency of in-place density testing and cores for in-place density testing
 - For acceptance testing, recommend vacuum sealing method for cores with greater than 2% water absorption and consider tightening the 2% water absorption requirement to less than 2%.