



Asphalt Pavement Industry Survey on Recycled Materials and Warm-Mix Asphalt Usage 2017

IS-138 Appendix A:
Methodology & Survey Forms



8th Annual Survey

Asphalt Pavement Industry Survey on Recycled Materials and Warm-Mix Asphalt Usage: 2017

Appendix A

Appendix A to the eighth edition of the Asphalt Pavement Industry Survey on Recycled Materials and Warm-Mix Asphalt Usage (Williams et al., 2018) provides details on the methodology used to collect and analyze the 2017 construction season survey data, as well as reproduces the primary survey instruments used to collect data from asphalt mixture producers and from the State Asphalt Pavement Associations (SAPA). Producers were asked primarily to provide company-/plant-level data, while SAPAs were asked to provide industry-level data for their state.

Survey Methodology

To collect and analyze the data summarized in the main *Asphalt Pavement Industry Survey on Recycled Materials and Warm-Mix Asphalt Usage* report for the 2017 construction season survey, the following tasks were conducted:

1. Develop an online survey that enables an analysis of the quantities of recycled materials being used in asphalt mixtures, as well as the total amount of WMA produced nationally.
2. Conduct a voluntary survey of asphalt mix producers throughout the United States and follow up with verbal requests for information in locations where responses were low.
3. Estimate the total asphalt mixture market in each state or territory by using data provided by SAPAs and the U.S. Department of Transportation federal-aid highway apportionment to determine a weighting factor for each state and reconciling the total U.S. asphalt mix tonnage with national estimates.
4. Analyze and summarize the information nationally and in each state and to prepare a final report.

The survey was conducted using an online survey platform, SurveyMonkey®. Table A1 summarizes the questions asked in each section of the producer survey. Sections 1 through 4 have remained consistent from the 2009 to 2014 construction seasons. Additional questions were added to Sections 2 through 4 for the 2015 to 2017 construction seasons to gather additional information about RAP and RAS stockpiling, fractionation, the use of softer binders and recycling agents, the acceptance of processed RAS, and the use of WMA technologies at HMA temperatures. For 2017, the Section 3 question about tons of unprocessed shingles accepted was modified to ask about the type of unprocessed shingles accepted, and the Section 4 question about the use of WMA additives at HMA temperatures was modified to gather additional information. A Section 3 question about RAS binder blending was removed. Section 5 was added in the 2012 construction season survey to collect information on the use of other recycled material in asphalt mixtures. Starting in 2015, the Section 5 question asking about specific recycled materials was modified to replace one user-provided response with cellulose fiber. A copy of the producer survey form used to gather information for the 2017 construction season is provided in the Survey Instrument section of Appendix A.

Producers were notified of the survey through several forums and electronic media. Notice were placed in NAPA's e-newsletter, *ActionNews*, informing members of the survey and asking for their participation. SAPAs solicited participation by placing notices on their websites and in their newsletters. Announcements were made at NAPA meetings, as well as at several state asphalt conferences. A press release was sent to construction industry trade media, and was published in print and online. Notices of the survey and links were also shared through social media channels, primarily Twitter, Facebook, and LinkedIn. Follow up with producers and SAPAs was conducted via email, social media, and telephone.

Table A1: Survey Questions Summary

| Section 1: General Information | Section 2: RAP | Section 3: RAS | Section 4: WMA | Section 5: Other Recycled Materials |
|--|--|--|--|--|
| Contact Information | Tons Accepted | Tons Unprocessed Tear-Off Shingles Accepted | Average % Produced for DOT Tons | Were Other Recycled Materials Used (Y/N) |
| State Information Is Provided for | Tons Used in HMA/WMA Mixes | Tons Unprocessed Manufacturers' Waste Accepted | Average % Produced for Other Agency Tons | Other Recycled Materials Used (GTR, Steel Slag, Blast Furnace Slag, Cellulose Fiber, CCP, Up to Two User-Provided Responses) |
| Number of Production Plants | Tons Used in Aggregate Base | Tons Processed Shingles Accepted | Average % Produced for Commercial & Residential Tons | Tons of HMA/WMA Produced Using Each Recycled Material |
| DOT Tons | Tons Used in Cold-Mix Asphalt | Tons Used in HMA/WMA Mixes | Chemical Admixture % | Tons of Each Other Recycled Product Used |
| Other Agency Tons | Tons Used in Other | Tons Used in Aggregate Base | Additive Foaming % | |
| Commercial & Residential Tons | Tons Landfilled | Tons Used in Cold-Mix Asphalt | Production Plant Foaming % | |
| | Average % for DOT Mixtures | Tons Used in Other | Organic Additive % | |
| | Average % for Other Agency Mixtures | Tons Landfilled | % of HMA Tons Produced Using Chemical Admixture | |
| | Average % for Commercial & Residential Mixtures | Average % for DOT Mixtures | % of HMA Tons Produced Using Additive Foaming | |
| | Excess RAP (Y/N) | Average % for Other Agency Mixtures | % of HMA Tons Produced Using Plant Foaming | |
| | Tons of RAP Stockpiled | Average % for Commercial & Residential Mixtures | % of HMA Tons Produced Using Organic Additive | |
| | Percentage of RAP Fractionated | Excess RAS (Y/N) | | |
| | Percentage of RAP Mixtures Using Softer Asphalt Binder | Tons of RAS Stockpiled | | |
| | Percentage of RAP Mixtures Using Recycling Agents | What Sectors Allow RAS | | |
| | | Estimated percent of RAS Binder Blending with New Asphalt Binder | | |
| | | Percentage of RAP Mixtures Using Softer Asphalt Binder | | |
| | | Percentage of RAP Mixtures Using Recycling Agents | | |
| Yellow indicates a new question for 2017 | | Red indicates a question removed for 2017 | Cyan indicates a question modified for 2017 | |

Asphalt mixture producers then went to the SurveyMonkey website to complete the survey form. Some producers submitted PDF forms and the data were entered into SurveyMonkey by NAPA. Some producers submitted data using an Excel spreadsheet developed by NAPA. After the initial data was gathered and analyzed, anomalies in individual producer records were identified and reconciled.

To collect industry-level data from the SAPAs, a 10-question survey was similarly fielded on an online survey platform, SurveyMonkey®. A copy of the survey form used to gather information for the 2017 construction season from SAPAs follows the producer survey form in the Survey Instrument section of Appendix A. In a handful of states without SAPAs, industry-level data was provided by an Associated General Contractors (AGC) chapter or a similar knowledgeable source.

To determine the estimated total amount of RAP and RAS used and WMA produced nationwide and in each state/territory, the total amount of asphalt mix produced in each state/territory needed to be determined. Total tonnage of asphalt mix produced represents both commercial (i.e., private sector) and governmental (i.e., DOT and Other Agency) tonnages. Estimated tonnages for each sector were provided by SAPAs for 32 states/territories, totaling more than 274 million tons.

To estimate the total tons in states where a SAPA estimate of total tonnage was not available, a power curve relationship based on an examination of the relationship between SAPA-estimated tons and federal-aid highway apportionment (FHWA, 2017) for those states was determined, resulting in Equation A1. This is the same methodology used to estimate tonnage in previous versions of this survey, as detailed in Hansen & Newcomb (2011), with the formula updated annually as SAPA-reported estimates and state federal apportionments change.

$$\text{Total Estimated Tons} = 0.0014 \times (\text{State Federal Apportionment})^{1.1064} \quad [A1]$$

Since 2012, 31 states have moved to raise additional local funds for transportation (T4America, n.d.). These additional funds are not accounted for in Equation A1, which can lead to underestimation of total tonnage in some states. Similarly, because federal funding for the U.S. territories is through the Territorial and Puerto Rico Highway Program (FHWA, 2016) instead of state apportionment, estimates for American Samoa and Puerto Rico were calculated using Equation A1 and Territorial and Puerto Rico Highway Program funding levels. These two caveats do have an impact on Appendix B and some other the state-level data included in this report; however, it has little impact on the national values.

Appendix B and certain tables in this report detail survey responses and estimated values on a state-by-state basis. To keep specific producer data confidential, no state-specific information is provided in the tables or appendix if fewer than three producers from the state responded to the survey. Information from states with fewer than three responding companies is included in the estimated national values, however.

Survey Instrument

As outlined above, the following pages of this appendix provide a copy of the survey instrument used to collect responses from participants. The majority of asphalt mixture producers participating in the survey used the online survey platform SurveyMonkey® to provide their responses. Some producers submitted PDF forms and the data were entered into SurveyMonkey by NAPA staff. Some multistate producers submitted data using a spreadsheet developed by NAPA to collect the same information. The producer version of the survey begins on page 6; the SAPA version begins on page 23.

References

- FHWA (2016). FAST Act Fact Sheet: Territorial and Puerto Rico Program [web page]. Federal Highway Administration, Washington, D.C. <https://www.fhwa.dot.gov/fastact/factsheets/territorialprhighway/sfs.cfm> [Accessed 20 April 2018]
- FHWA (2017). Table 11, Part 4: Summary of Apportionments Authorized for Fiscal Year (FY) 2017 [web page]. Federal Highway Administration, Washington, D.C. <https://www.fhwa.dot.gov/fastact/comptables2017/table11p4.cfm> [Accessed 20 April 2018]
- Hansen, K.R., & D.E. Newcomb (2011). *Asphalt Pavement Mix Production Survey: Reclaimed Asphalt Pavement, Reclaimed Asphalt Shingles, Warm-Mix Asphalt Usage: 2009–2010* (IS 138). National Asphalt Pavement Association, Lanham, Maryland.
- T4America (n.d.) State Transportation Funding [web page]. Transportation for America, Washington, D.C. <http://t4america.org/maps-tools/state-transportation-funding/> [Accessed 4 May 2018]
- Williams, B.A., A. Copeland, & T.C. Ross (2018). *Annual Asphalt Pavement Industry Survey on Recycled Materials and Warm-Mix Asphalt Usage: 2017, 8th Annual Survey* (IS 138). National Asphalt Pavement Association, Lanham, Maryland.

2017 Construction Season Survey: Producer Version



Recycled Materials and WMA Survey 2017

Purpose

The National Asphalt Pavement Association is working with the Federal Highway Administration to determine the amount of hot-mix asphalt (HMA), warm-mix asphalt (WMA), and recycled materials being produced and used in each state. This survey will be used to collect this data.

It is important for the industry that you complete this survey so that we have accurate information regarding the use of recycled materials and WMA and to identify areas needing assistance in implementation.

DATA FROM THIS SURVEY WILL BE CONFIDENTIAL AND WILL BE USED ONLY FOR THE PURPOSES OF DETERMINING THESE QUANTITIES. IT WILL NOT BE USED FOR ANY OTHER PURPOSE. DATA WILL BE REPORTED BY STATE ONLY, AND NO STATE-SPECIFIC DATA WILL BE REPORTED WHEN FEWER THAN THREE COMPANIES/BRANCHES RESPOND WITHIN A STATE, NO COMPANY-SPECIFIC INFORMATION WILL BE DISCLOSED IN ANY WAY.

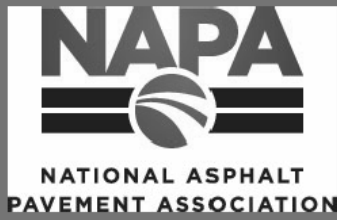
It is recommended that you print a copy of the full survey —[download a PDF](#)— to make sure you have the necessary data at hand before beginning the online survey.

Companies with multi-state operations may also wish to [download a spreadsheet](#) to report their data. Please return the completed spreadsheet to Brett Williams, NAPA Director of Engineering & Technical Support, at bwilliams@asphaltpavement.org.

Survey results will be shared with industry, government agencies, and officials to help in the implementation of recycling and warm-mix technologies. The data collected from this survey provides insight into trends, current practice, and is utilized to highlight the sustainability of asphalt mixtures. These results are also used by FHWA, Energy Information Administration, Environmental Protection Agency, and other federal, state, and local agencies to determine the impact of recycled materials and WMA.

By completing this survey you will be eligible to receive a complimentary copy of the full report.

Your participation is greatly appreciated.



Contact Information

The following information will be used only to confirm that we do not get duplicate information from a company and to contact you if we have any questions regarding your answers.

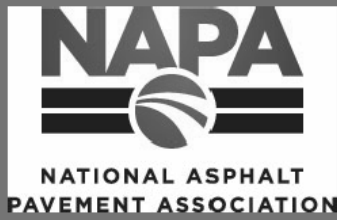
Contact Brett Williams at bwilliams@asphaltpavement.org, or Audrey Copeland at audrey@asphaltpavement.org, or NAPA by phone at 888-468-6499 if you have any questions.

* 1. Company/Branch Name:

* 2. Contact Person's Name & Address

* 3. Contact Person's Email

* 4. Contact Person's Phone Number



State

Please select the state for which you are providing the information.

If your branch operates in more than one state, please complete a separate questionnaire for each state. If a plant provides mix for more than one state, please divide the tonnage accordingly, using your best estimate if specific data is not available.

* 5. Which state is the information provided for?

- | | | |
|--|--|---|
| <input type="radio"/> Alabama | <input type="radio"/> Kentucky | <input type="radio"/> Ohio |
| <input type="radio"/> Alaska | <input type="radio"/> Louisiana | <input type="radio"/> Oklahoma |
| <input type="radio"/> American Samoa | <input type="radio"/> Maine | <input type="radio"/> Oregon |
| <input type="radio"/> Arizona | <input type="radio"/> Maryland | <input type="radio"/> Pennsylvania |
| <input type="radio"/> Arkansas | <input type="radio"/> Massachusetts | <input type="radio"/> Puerto Rico |
| <input type="radio"/> California | <input type="radio"/> Michigan | <input type="radio"/> Rhode Island |
| <input type="radio"/> Colorado | <input type="radio"/> Minnesota | <input type="radio"/> South Carolina |
| <input type="radio"/> Connecticut | <input type="radio"/> Mississippi | <input type="radio"/> South Dakota |
| <input type="radio"/> Delaware | <input type="radio"/> Missouri | <input type="radio"/> Tennessee |
| <input type="radio"/> District of Columbia | <input type="radio"/> Montana | <input type="radio"/> Texas |
| <input type="radio"/> Florida | <input type="radio"/> Nebraska | <input type="radio"/> US Virgin Islands |
| <input type="radio"/> Georgia | <input type="radio"/> Nevada | <input type="radio"/> Utah |
| <input type="radio"/> Guam | <input type="radio"/> New Hampshire | <input type="radio"/> Vermont |
| <input type="radio"/> Hawaii | <input type="radio"/> New Jersey | <input type="radio"/> Virginia |
| <input type="radio"/> Idaho | <input type="radio"/> New Mexico | <input type="radio"/> Washington |
| <input type="radio"/> Illinois | <input type="radio"/> New York | <input type="radio"/> West Virginia |
| <input type="radio"/> Indiana | <input type="radio"/> North Carolina | <input type="radio"/> Wisconsin |
| <input type="radio"/> Iowa | <input type="radio"/> North Dakota | <input type="radio"/> Wyoming |
| <input type="radio"/> Kansas | <input type="radio"/> Northern Mariana Islands | |

* 6. How many plants does this survey response cover?

Number of plants



Total Asphalt Tonnage for 2017

Please complete the following information for the total tonnage of all asphalt production in 2017.

* 7. What was your total tonnage of asphalt mixes in 2017 for the following sectors? (Use best estimate if data is not available.)

State DOT

Other Agency (City, County, FAA, Military, Toll Authorities)

Commercial & Residential



RAP Supply and Use 2017

Please complete the following information regarding the amount of RAP received and used for 2017.

* 9. How many tons of reclaimed asphalt pavement and asphalt millings were accepted/delivered to your facilities in the state in 2017?

Tons:

* 10. How many tons of RAP were used in 2017 for the following purposes? (Use best estimate if data not available.)

Recycled Back into HMA/WMA Mixes:

Aggregate Base:

Cold Mix:

Other:

Landfilled:

* 11. What was the average RAP percentage used in asphalt mixes during 2017 for the following sectors? (Use best estimate if data not available.)

State DOT

Other Agency (City, County, FAA, Military, Toll Authorities)

Commercial & Residential

* 12. At the end of the year 2017 did you have excess RAP (processed or unprocessed) in inventory?

Yes

No

* 13. Please estimate how many tons of RAP you had stockpiled at the end of 2017. (Use best estimate if data not available.)

14. What percentage of the RAP processed is fractionated into two or more sizes? (Use best estimate if data not available.)

15. What percent of mixes using RAP were produced using a softer grade of asphalt binder? (Use best estimate if data not available.)

16. What percent of mixes using RAP were produced using recycling agents? (Use best estimate if data not available.)



Reclaimed Asphalt Shingles (RAS) Supply and Use for 2017

Please complete the following information on the amount of waste shingles received (processed and unprocessed) and used for 2017.

* 17. Did you accept waste shingles and/or process or use reclaimed asphalt shingles (RAS) in 2017?

Yes

No



Reclaimed Asphalt Shingles (RAS) Supply and Use for 2017

Please complete the following information regarding the amount of waste shingles received (processed and unprocessed) and used during 2017.

* 18. How many tons of shingles were accepted/delivered to your facilities in the state in 2017?

Unprocessed

Tear-off

Shingles:

Unprocessed

Manufacture

rs'

Waste Shingl

es:

Processed

Shingles:

* 19. How many tons of reclaimed asphalt shingles (RAS) were used for the following purposes in 2017? (Use best estimate if data not available.)

Recycled into HMA/WMA Mixes:

Aggregate Base:

Cold Mix:

Other:

Landfilled:

* 20. What was average RAS percentage used in asphalt mixes in 2017 for the following sectors? (Use best estimate if data not available.)

State DOT

Other Agency (City, County, FAA, Military, Toll Authorities)

Commercial & Residential

* 21. At the end of the year 2017 did you have any surplus RAS stockpiled? (Include processed and unprocessed shingles.)

Yes

No

* 22. Please estimate how many tons of RAS you had stockpiled at the end of 2017. (Use best estimate if data not available.)

23. Is RAS allowed in

| | ALL | SOME | NONE |
|----------------------------------|-----------------------|-----------------------|-----------------------|
| DOT mixes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other Agency mixes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Commercial and Residential mixes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

24. What percent of mixes using RAS were produced using a softer grade of asphalt binder? (Use best estimate if data not available.)

25. What percent of mixes using RAS were produced using recycling agents? (Use best estimate if data not available.)



Warm-Mix Asphalt Production for 2017

Warm-mix asphalt is the generic term for a variety of technologies that allow the producers of asphalt pavement material to lower the temperatures at which the material is mixed and placed on the road by at least 10° F.

* 26. Did any of your plants in this state use warm-mix asphalt technologies in 2017?

- Yes
- No



Warm-Mix Asphalt Production for 2017

Warm-mix asphalt is the generic term for a variety of technologies that allow the producers of asphalt pavement material to lower the temperatures at which the material is mixed and placed on the road by atleast 10^o F.

* 27. What was average percent of mixes produced using warm-mix asphalt technologies in 2017 for the different sectors? (Use best estimate if data not available.)

State DOT

Other Agency (City, County, FAA, Military, Toll Authorities)

Commercial & Residential

* 28. What percentage of the total warm-mix asphalt (WMA) for 2017 was produced using the following technologies? (Use best estimate if data not available.)

Chemical Admixture

Additive (Zeolite) Foaming

Plant Foaming

Organic (Wax) Additive

29. Were any of the warm-mix technologies utilized for mixes produced at hot-mix temperatures (i.e., without lowering temperatures by at least 10^o F.) If yes, please select the approximate percentage range of HMA tons produced using such technologies without lowering temperatures.

| | Yes/No | % of HMA tons produced with technology |
|----------------------------|----------------------|--|
| Chemical Admixture | <input type="text"/> | <input type="text"/> |
| Additive (Zeolite) Foaming | <input type="text"/> | <input type="text"/> |
| Plant Foaming | <input type="text"/> | <input type="text"/> |
| Organic (Wax) Additive | <input type="text"/> | <input type="text"/> |



Other Recycled Material for 2017

Please let us know if you used any other recycled materials in HMA/WMA mixes in 2017.

* 30. Did you use other recycled materials (excluding RAP and RAS) in your mixes in 2017?
(This includes materials added to the mix such as: ground tire rubber, blast furnace slag, steel slag, boiler slag, other coal combustion products, glass, fly ash, bottom ash, foundry sand, cellulose fibers, etc.)

Yes

No

Other Recycled Material for 2017

* 31. What other recycled material (excluding RAP and RAS) did you use in your mixes in 2017?

| | Yes | No |
|---------------------------|-----------------------|-----------------------|
| Ground Tire Rubber | <input type="radio"/> | <input type="radio"/> |
| Steel Slag | <input type="radio"/> | <input type="radio"/> |
| Blast Furnace Slag | <input type="radio"/> | <input type="radio"/> |
| Recycled Cellulose Fibers | <input type="radio"/> | <input type="radio"/> |
| Other 1* | <input type="radio"/> | <input type="radio"/> |
| Other 2* | <input type="radio"/> | <input type="radio"/> |

* Please describe the other recycled materials used.

* 32. How many tons of HMA/WMA was produced using this product. (Use best estimate if data not available.)

| | |
|---------------------------|---|
| Ground Tire Rubber | <input style="width: 100%;" type="text"/> |
| Steel Slag | <input style="width: 100%;" type="text"/> |
| Blast Furnace Slag | <input style="width: 100%;" type="text"/> |
| Recycled Cellulose Fibers | <input style="width: 100%;" type="text"/> |
| Other 1 | <input style="width: 100%;" type="text"/> |
| Other 2 | <input style="width: 100%;" type="text"/> |

33. How many tons of the recycled product was used in 2017? (Enter 0 if you do not have a reasonable estimate of this quantity)

Ground Tire Rubber

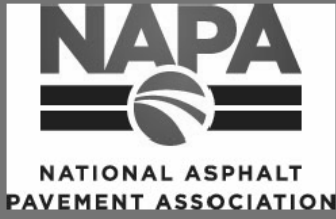
Steel Slag

Blast Furnace Slag

Recycled Cellulose Fibers

Other 1

Other 2



Thank You

34. Would you like a complimentary copy of the final report?

- Yes
- No

2017 Construction Season Survey: SAPA Version



2017 SAPA Survey for RMWMA

2017 Recycled Materials and WMA Survey SAPA data

Please answer the following questions by April 30, 2018, to help NAPA in preparing the 2017 Recycled Materials and WMA Survey. The additional information you provide us on RAP and RAS will enhance the information we already provide in the survey report. If you have any questions please contact Brett Williams at bwilliams@asphaltpavement.org.

Thank you

* 1. Name:

* 2. Email:

* 3. State:

* 4. What is your best estimate of the total tons of asphalt mixture placed in your state in 2017. (This includes mixes produced for DOT, Other Agencies, and Commercial & Residential sectors.) [The 2016 estimates are provided below for your reference.]

2016 Estimated Tons by State

Table 3: Summary of 2016 Estimated and Reported Asphalt Mixture Tons by State

| State | Tons, Millions | | Reported % of Estimated | State | Tons, Millions | | Reported % of Estimated |
|----------------------|----------------|----------|-------------------------|----------------|----------------|---------------------|-------------------------|
| | Estimated | Reported | | | Estimated | Reported | |
| Alabama | 7.50 | 3.76 | 50% | Montana | 3.92 | * | * |
| Alaska | 4.64 | * | * | Nebraska | 2.72 | * | * |
| Arizona | 7.14 | 2.42 | 34% | Nevada | 3.28 | 0.95 | 29% |
| Arkansas | 5.50 | 2.31 | 42% | New Hampshire | 1.43 | 1.50 | 105% |
| California | 25.00 | 9.68 | 39% | New Jersey | 4.50 | 2.73 | 61% |
| Colorado | 7.50 | 2.38 | 32% | New Mexico | 3.47 | 0.99 | 29% |
| Connecticut | 4.55 | 2.48 | 55% | New York | 17.00 | 5.68 | 33% |
| Delaware | 1.59 | * | * | North Carolina | 15.00 | 4.77 | 32% |
| District of Columbia | 1.38 | NCR | NCR | North Dakota | 2.10 | * | * |
| Florida | 15.00 | 5.36 | 36% | Ohio | 19.00 | 10.41 | 55% |
| Georgia | 10.00 | 6.95 | 70% | Oklahoma | 5.21 | 2.21 | 42% |
| Hawaii | 1.10 | * | * | Oregon | 5.40 | 1.61 | 30% |
| Idaho | 2.68 | 1.27 | 47% | Pennsylvania | 19.00 | 7.32 | 39% |
| Illinois | 14.10 | 2.18 | 15% | Puerto Rico | 1.00 | NCR | NCR |
| Indiana | 10.00 | 4.79 | 48% | Rhode Island | 1.90 | * | * |
| Iowa | 3.92 | 2.20 | 56% | South Carolina | 6.50 | 3.11 | 48% |
| Kansas | 3.50 | 1.65 | 47% | South Dakota | 1.60 | * | * |
| Kentucky | 6.90 | 3.23 | 47% | Tennessee | 8.24 | 2.36 | 29% |
| Louisiana | 2.65 | 1.85 | 70% | Texas | 24.00 | 7.97 | 33% |
| Maine | 1.59 | 2.07 | 130% | Utah | 3.60 | 4.06 | 113% |
| Maryland | 7.50 | 3.34 | 45% | Vermont | 1.72 | * | * |
| Massachusetts | 6.40 | 3.02 | 47% | Virginia | 12.00 | 7.39 | 62% |
| Michigan | 14.00 | 5.92 | 42% | Washington | 5.83 | 1.87 | 32% |
| Minnesota | 13.00 | 4.64 | 36% | West Virginia | 4.12 | 2.17 | 53% |
| Mississippi | 4.72 | 2.69 | 57% | Wisconsin | 12.00 | 7.14 | 60% |
| Missouri | 6.30 | 1.82 | 29% | Wyoming | 2.22 | 0.34 | 15% |
| | | | | Total | 374.90 | 155.80 [†] | 42% |

NCR No Companies Responding

* Fewer than 3 Companies Reporting

[†] Total Reported Tons includes values from state with fewer than 3 Companies Reporting

 SAPA Estimated Tons

5. Comments:

6. Do producers in your state fractionate RAP?

Yes

No

7. Is RAS allowed in

| | ALL | SOME | NONE |
|--------------------------------|-----------------------|-----------------------|-----------------------|
| DOT mixes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Other Agency mixes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Commercial / Residential mixes | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Comments:

8. Does your state require, allow, or prohibit the use of recycling agents or softer binders in high Asphalt Binder Replacement mixes? (RAP, RAS, or RAP+RAS)?

| | Require | Allow | Prohibit |
|------------------|-----------------------|-----------------------|-----------------------|
| Recycling Agent: | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Softer Binders: | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Comments:

9. What limits the use of RAP in your state?

- Specification limits
- Volumetric requirements
- Mixture performance
- Availability of RAP
- Asphalt plant capabilities
- Economics
- Others (Please list)

10. What limits the use of RAS in your state?

- Specification limits
- Volumetric requirements
- Mixture performance
- Availability of RAS
- Asphalt plant capabilities
- Economics
- Others (Please list)



National Asphalt Pavement Association

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