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# Asphalt Pavement Industry Survey on Recycled Materials and Warm-Mix Asphalt Usage 2018

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IS-138 Appendix B:  
State-by-State Use of  
Recycled Materials and Warm-Mix Asphalt  
In Asphalt Pavement Mixtures

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9th Annual Survey

# Asphalt Pavement Industry Survey on Recycled Materials and Warm-Mix Asphalt Usage: 2018

## Appendix B

### Introduction

Appendix B provides a state-by-state breakdown of data reported in the *Asphalt Pavement Industry Survey on Recycled Materials and Warm-Mix Asphalt Usage* report for the 2018 construction season survey (Williams et al., 2019), including information from Tables 5, 6, 7, 8, 11, 12 and 15. **The accuracy of the state-level data and estimates will vary depending upon the number of companies participating in the survey in a given state and the tonnage produced by each respondent.** Appendix A outlines the methodology used to collect data and to generate estimates.

Appendix B reports data for all 50 U.S. states, as well as the District of Columbia and the five U.S. territories. In instances where fewer than three companies in a state/territory responded to the survey, only estimated total tonnages are reported to protect proprietary company data. Table 1 in the main report, republished below, summarizes the number of respondents from each state and territory. A total of 272 companies representing 1,328 production plants responded to the 2018 construction season survey. Branches, subsidiaries, and operating units are counted as unique companies in Table 1 and throughout the report. Throughout the tables, where percentages and totals are calculated, the numbers may not add up exactly due to rounding.

A degree of fluctuation in year-to-year comparisons of data is influenced by which companies responded to the 2018 construction season survey versus prior-year survey respondents. Approximately 80 percent of 2017 responding companies participated in the 2018 survey, too. Additional factors influencing the reliability of state-level data in this appendix are explained in the Data Estimation Method section of Appendix A.

**Table 1: Number of Companies Completing 2018 Construction Season Survey in Each State/Territory**

State	Cos.	Prod. Plants	State	Cos.	Prod. Plants	State	Cos.	Prod. Plants
Alabama	9	49	Kentucky	10	51	Ohio	9	88
Alaska	*	*	Louisiana	4	4	Oklahoma	6	17
American Samoa	*	*	Maine	*	*	Oregon	4	14
Arizona	5	27	Maryland	11	25	Pennsylvania	8	46
Arkansas	7	29	Massachusetts	7	34	Puerto Rico	NCR	NCR
California	6	52	Michigan	5	40	Rhode Island	*	*
Colorado	3	15	Minnesota	5	28	South Carolina	6	24
Connecticut	3	15	Mississippi	9	29	South Dakota	NCR	NCR
Delaware	*	*	Missouri	9	32	Tennessee	5	40
District of Columbia	*	*	Montana	*	*	Texas	6	51
Florida	13	48	Nebraska	3	7	U.S. Virgin Islands	*	*
Georgia	6	46	Nevada	*	*	Utah	9	20
Guam	NCR	NCR	New Hampshire	4	16	Vermont	*	*
Hawaii	3	8	New Jersey	3	19	Virginia	7	36
Idaho	5	18	New Mexico	3	5	Washington	9	35
Illinois	12	25	New York	12	58	West Virginia	3	15
Indiana	7	54	North Carolina	7	62	Wisconsin	6	64
Iowa	4	16	North Dakota	*	*	Wyoming	*	*
Kansas	4	19	No. Mariana Islands	NCR	NCR	<b>Total†</b>	272	1,328

NCR = No companies responding

\* = Fewer than 3 companies reporting

† = Total includes companies/production plants from states with fewer than 3 companies reporting.

Numbers may not add up exactly due to rounding

ALABAMA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	4.9	5.0	7.0	6.7
DOT	3.3	3.4	4.8	4.6
Other Agency	0.8	0.9	1.2	1.2
Commercial & Residential	0.8	0.7	1.1	0.9
No. of Companies Reporting	6	9		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	1.3	0.8	1.9	1.1
Used in HMA/WMA Mixtures	1.2	1.3	1.7	1.7
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	1.94	1.8	2.78	2.41
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	23.7%	23.6%		
Average % for Other Agency Mixtures <sup>1</sup>	24.7%	25.2%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	26.8%	27.8%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			24.3%	26.0%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	29%	16%		
% of RAP Mixtures Using Softer Binders	0%	0%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	10.0	0.0	13.4
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	5.0	0.0	6.7
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	40.5	0.0	54.3
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.10%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.10%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.20%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.10%
	Other Reported Data			
% Companies Reporting Using RAS	0%	11%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA Technologies</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.7	1.5
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				1.3
DOT	13%	40%	0.6	1.8
Other Agency	3%	55%	0.0	0.7
Commercial & Residential	3%	30%	0.0	0.3
	Other Reported Data			
Chemical Additive, % of Market	0%	34%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	67%	66%		
Organic Additive, % of Market	33%	0%		
<b>Other Reported Data</b>			Tons, Millions	
% Companies Reporting Using WMA Technologies	50%	33%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

ALASKA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	*	*	5.1	2.0
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
No. of Companies Reporting	*	*		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAP Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAP	*	*		
% of RAP Fractionated	*	*		
% of RAP Mixtures Using Softer Binders	*	*		
% of RAP Mixtures Using Rejuvenators	*	*		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	*	*	*	*
Processed Shingles Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAS Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAS	*	*		
% of RAS Mixtures Using Softer Binders	*	*		
% of RAS Mixtures Using Rejuvenators	*	*		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			*	*
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>			*	*
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	*	*		
Additive Foaming, % of Market	*	*		
Plant Foaming, % of Market	*	*		
Organic Additive, % of Market	*	*		
% Companies Reporting Using WMA Technologies	*	*		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

AMERICAN SAMOA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	*	*	0.03	0.03
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
No. of Companies Reporting	*	*		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAP Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAP	*	*		
% of RAP Fractionated	*	*		
% of RAP Mixtures Using Softer Binders	*	*		
% of RAP Mixtures Using Rejuvenators	*	*		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	*	*	*	*
Processed Shingles Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAS Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAS	*	*		
% of RAS Mixtures Using Softer Binders	*	*		
% of RAS Mixtures Using Rejuvenators	*	*		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			*	*
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>			*	*
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	*	*		
Additive Foaming, % of Market	*	*		
Plant Foaming, % of Market	*	*		
Organic Additive, % of Market	*	*		
% Companies Reporting Using WMA Technologies	*	*		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

ARIZONA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	1.2	3.7	6.5	7.6
DOT	0.2	1.9	1.2	3.9
Other Agency	0.2	0.1	1.1	0.1
Commercial & Residential	0.8	1.7	4.3	3.5
No. of Companies Reporting	3	5		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.1	0.8	0.7	1.6
Used in HMA/WMA Mixtures	0.1	0.4	0.6	0.9
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.10	0.58	0.54	1.18
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	11.9%	12.3%		
Average % for Other Agency Mixtures <sup>1</sup>	5.0%	11.0%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	10.2%	13.5%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			9.5%	11.6%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	0%	10%		
% of RAP Mixtures Using Softer Binders	23%	11%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	0.0	0.0	0.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	0%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			4.3	0.3
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.8
DOT	50%	6%	0.6	0.2
Other Agency	0%	0%	0.0	0.0
Commercial & Residential	87%	25%	3.7	0.9
	Other Reported Data			
Chemical Additive, % of Market	0%	45%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	100%	55%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	67%	40%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

ARKANSAS	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	1.9	3.1	6.0	5.4
DOT	1.3	0.6	4.2	1.0
Other Agency	0.3	1.9	0.9	3.4
Commercial & Residential	0.3	0.6	0.9	1.0
No. of Companies Reporting	4	7		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.1	0.2	0.5	0.3
Used in HMA/WMA Mixtures	0.2	0.4	0.7	0.6
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.20	0.30	0.64	0.52
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	11.8%	12.1%		
Average % for Other Agency Mixtures <sup>1</sup>	8.5%	11.3%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	10.8%	13.4%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			11.2%	11.5%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	0%	21%		
% of RAP Mixtures Using Softer Binders	0%	14%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	8.5	8.0	26.7	13.9
Processed Shingles Accepted	0.0	11.6	0.0	20.2
Used in HMA/WMA Mixtures	6.1	49.4	19.0	86.1
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	38.7	33.0	121.6	57.5
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.10%	1.32%		
Average % for Other Agency Mixtures <sup>1</sup>	0.80%	1.58%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.80%	1.61%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.32%	1.59%
	Other Reported Data			
% Companies Reporting Using RAS	25%	71%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			4.1	0.4
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				1.6
DOT	72%	53%	3.0	0.5
Other Agency	51%	35%	0.4	1.2
Commercial & Residential	72%	30%	0.7	0.3
	Other Reported Data			
WMA Technologies	Other Reported Data			
Chemical Additive, % of Market	0%	2%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	100%	100%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	100%	29%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

CALIFORNIA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	5.9	10.8	26.0	27.7
DOT	1.1	2.9	4.8	7.4
Other Agency	1.6	2.1	6.9	5.4
Commercial & Residential	3.3	5.8	14.3	14.9
No. of Companies Reporting	6	6		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	1.1	2.4	4.8	6.2
Used in HMA/WMA Mixtures	1.1	1.7	4.7	4.4
Used as Aggregate	0.0	0.2	0.0	0.6
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.60	1.52	2.63	3.90
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	14.6%	15.4%		
Average % for Other Agency Mixtures <sup>1</sup>	23.7%	15.3%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	16.6%	18.1%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			18.1%	15.7%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	57%	28%		
% of RAP Mixtures Using Softer Binders	21%	28%		
% of RAP Mixtures Using Rejuvenators	38%	8%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	10.0	0	25.6
Processed Shingles Accepted	6.0	0.0	26.3	0.0
Used in HMA/WMA Mixtures	1.9	7.0	8.3	18.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	4.0	10.0	17.5	25.6
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.06%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.10%	0.07%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.03%	0.06%
	Other Reported Data			
% Companies Reporting Using RAS	17%	17%		
% of RAS Mixtures Using Softer Binders	100%	100%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			6.5	4.5
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				2.0
DOT	24%	26%	1.1	1.9
Other Agency	24%	39%	1.7	2.1
Commercial & Residential	26%	17%	3.7	2.5
	Other Reported Data			
WMA Technologies	Other Reported Data			
Chemical Additive, % of Market	27%	40%		
Additive Foaming, % of Market	0%	4%		
Plant Foaming, % of Market	73%	56%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	67%	100%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.



Numbers may not add up exactly due to rounding

COLORADO	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	2.0	2.0	5.3	7.8
DOT	0.8	0.3	2.0	1.2
Other Agency	0.7	0.9	1.8	3.5
Commercial & Residential	0.5	0.8	1.4	3.1
No. of Companies Reporting	5	3		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.5	0.6	1.4	2.4
Used in HMA/WMA Mixtures	0.5	0.4	1.2	1.6
Used as Aggregate	0.0	0.1	0.1	0.3
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.70	0.37	1.85	1.46
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	25.7%	19.7%		
Average % for Other Agency Mixtures <sup>1</sup>	23.1%	19.7%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	21.1%	21.7%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			23.5%	20.0%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	22%	33%		
% of RAP Mixtures Using Softer Binders	0%	25%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	7.8	7.2	20.7	28.1
	Avg. % Used in Mixtures			
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	20%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.8	1.0
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.2
DOT	16%	11%	0.3	0.1
Other Agency	16%	16%	0.3	0.6
Commercial & Residential	13%	15%	0.2	0.5
	Other Reported Data			
Chemical Additive, % of Market	67%	82%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	33%	18%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	60%	67%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

CONNECTICUT	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	2.8	2.2	4.9	4.9
DOT	1.1	0.5	1.9	1.1
Other Agency	0.9	0.6	1.5	1.3
Commercial & Residential	0.9	1.1	1.5	2.5
No. of Companies Reporting	3	3		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.5	0.4	0.8	0.9
Used in HMA/WMA Mixtures	0.5	0.3	0.9	0.8
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	1.14	1.00	1.97	2.22
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	13.9%	15.0%		
Average % for Other Agency Mixtures <sup>1</sup>	19.5%	15.7%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	20.2%	16.3%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			17.6%	15.3%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	0%	17%		
% of RAP Mixtures Using Softer Binders	0%	0%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.9	0.7	1.6	1.6
Used in HMA/WMA Mixtures	0.0	0.7	0.0	1.6
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	0.1	0.0	0.2
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.10%	0.06%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.03%
	Other Reported Data			
% Companies Reporting Using RAS	33%	33%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			1.4	0.0
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				3.4
DOT	25%	94%	0.5	1.0
Other Agency	30%	68%	0.4	0.9
Commercial & Residential	30%	57%	0.5	1.4
	Other Reported Data			
WMA Technologies	Other Reported Data			
Chemical Additive, % of Market	2%	0%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	49%	100%		
Organic Additive, % of Market	49%	0%		
% Companies Reporting Using WMA Technologies	67%	33%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

DELAWARE	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	*	*	1.5	1.6
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
No. of Companies Reporting	*	*		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAP Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAP	*	*		
% of RAP Fractionated	*	*		
% of RAP Mixtures Using Softer Binders	*	*		
% of RAP Mixtures Using Rejuvenators	*	*		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	*	*	*	*
Processed Shingles Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAS Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAS	*	*		
% of RAS Mixtures Using Softer Binders	*	*		
% of RAS Mixtures Using Rejuvenators	*	*		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			*	*
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>			*	*
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	*	*		
Additive Foaming, % of Market	*	*		
Plant Foaming, % of Market	*	*		
Organic Additive, % of Market	*	*		
% Companies Reporting Using WMA Technologies	*	*		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

DISTRICT OF COLUMBIA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	*	*	1.4	1.5
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
No. of Companies Reporting	*	*		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAP Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAP	*	*		
% of RAP Fractionated	*	*		
% of RAP Mixtures Using Softer Binders	*	*		
% of RAP Mixtures Using Rejuvenators	*	*		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	*	*	*	*
Processed Shingles Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAS Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAS	*	*		
% of RAS Mixtures Using Softer Binders	*	*		
% of RAS Mixtures Using Rejuvenators	*	*		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			*	*
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				*
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	*	*		
Additive Foaming, % of Market	*	*		
Plant Foaming, % of Market	*	*		
Organic Additive, % of Market	*	*		
% Companies Reporting Using WMA Technologies	*	*		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

FLORIDA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	4.6	10.2	16.5	16.0
DOT	2.1	3.7	7.6	5.8
Other Agency	1.1	3.7	4.1	5.7
Commercial & Residential	1.4	2.8	4.9	4.5
No. of Companies Reporting	5	13		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	1.1	2.4	3.9	3.7
Used in HMA/WMA Mixtures	1.6	2.8	5.8	4.4
Used as Aggregate	0.0	0.1	0.0	0.2
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	2.04	0.29	7.26	0.45
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	34.0%	23.8%		
Average % for Other Agency Mixtures <sup>1</sup>	38.3%	26.7%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	35.1%	28.8%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			35.3%	27.3%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	28%	23%		
% of RAP Mixtures Using Softer Binders	83%	55%		
% of RAP Mixtures Using Rejuvenators	0%	12%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	6.5	0.0	10.2
Processed Shingles Accepted	0.0	5.0	0.0	7.8
Used in HMA/WMA Mixtures	0.0	4.5	0.0	7.1
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	9.5	1.0	33.9	1.6
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.04%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.06%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.04%
	Other Reported Data			
% Companies Reporting Using RAS	0%	8%		
% of RAS Mixtures Using Softer Binders	0%	100%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			1.1	2.1
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				4.0
DOT	2%	37%	0.2	2.2
Other Agency	5%	45%	0.2	2.6
Commercial & Residential	15%	30%	0.7	1.3
	Other Reported Data			
Chemical Additive, % of Market	100%	100%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	0%	0%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	40%	15%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

GEORGIA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	2.2	5.7	14.6	14.2
DOT	1.3	2.8	8.3	7.0
Other Agency	0.5	1.1	3.4	2.7
Commercial & Residential	0.5	1.8	3.0	4.5
No. of Companies Reporting	5	6		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.3	2.5	2.2	6.3
Used in HMA/WMA Mixtures	0.5	1.5	3.3	3.6
Used as Aggregate	0.0	0.0	0.2	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.7	0.0	1.7
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.36	3.80	2.37	9.47
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	20.6%	24.8%		
Average % for Other Agency Mixtures <sup>1</sup>	25.6%	24.8%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	25.6%	25.7%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			22.7%	25.4%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	8%	3%		
% of RAP Mixtures Using Softer Binders	0%	14%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	22.9	0.0	149.3	0.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	0%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			6.3	0.0
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				1.5
DOT	43%	14%	3.6	1.0
Other Agency	43%	1%	1.4	0.0
Commercial & Residential	43%	11%	1.3	0.5
	Other Reported Data			
Chemical Additive, % of Market	0%	0%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	100%	100%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	60%	17%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

GUAM	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	NCR	NCR	0.12	0.12
DOT	NCR	NCR	NCR	NCR
Other Agency	NCR	NCR	NCR	NCR
Commercial & Residential	NCR	NCR	NCR	NCR
No. of Companies Reporting	NCR	NCR		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	NCR	NCR	NCR	NCR
Used in HMA/WMA Mixtures	NCR	NCR	NCR	NCR
Used as Aggregate	NCR	NCR	NCR	NCR
Used in Cold-Mix Asphalt	NCR	NCR	NCR	NCR
Used in Other	NCR	NCR	NCR	NCR
Landfilled	NCR	NCR	NCR	NCR
Total Tons of RAP Stockpiled at Year-End	NCR	NCR	NCR	NCR
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	NCR	NCR		
Average % for Other Agency Mixtures <sup>1</sup>	NCR	NCR		
Average % for Commercial & Residential Mixtures <sup>1</sup>	NCR	NCR		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			NCR	NCR
	Other Reported Data			
% Companies Reporting Using RAP	NCR	NCR		
% of RAP Fractionated	NCR	NCR		
% of RAP Mixtures Using Softer Binders	NCR	NCR		
% of RAP Mixtures Using Rejuvenators	NCR	NCR		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	NCR	NCR	NCR	NCR
Processed Shingles Accepted	NCR	NCR	NCR	NCR
Used in HMA/WMA Mixtures	NCR	NCR	NCR	NCR
Used as Aggregate	NCR	NCR	NCR	NCR
Used in Cold-Mix Asphalt	NCR	NCR	NCR	NCR
Used in Other	NCR	NCR	NCR	NCR
Landfilled	NCR	NCR	NCR	NCR
Total Tons of RAS Stockpiled at Year-End	NCR	NCR	NCR	NCR
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	NCR	NCR		
Average % for Other Agency Mixtures <sup>1</sup>	NCR	NCR		
Average % for Commercial & Residential Mixtures <sup>1</sup>	NCR	NCR		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			NCR	NCR
	Other Reported Data			
% Companies Reporting Using RAS	NCR	NCR		
% of RAS Mixtures Using Softer Binders	NCR	NCR		
% of RAS Mixtures Using Rejuvenators	NCR	NCR		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			NCR	NCR
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				NCR
DOT	NCR	NCR	NCR	NCR
Other Agency	NCR	NCR	NCR	NCR
Commercial & Residential	NCR	NCR	NCR	NCR
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	NCR	NCR		
Additive Foaming, % of Market	NCR	NCR		
Plant Foaming, % of Market	NCR	NCR		
Organic Additive, % of Market	NCR	NCR		
% Companies Reporting Using WMA Technologies	NCR	NCR		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

HAWAII	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	0.8	0.7	1.1	1.1
DOT	0.2	0.3	0.3	0.5
Other Agency	0.5	0.3	0.7	0.5
Commercial & Residential	0.1	0.1	0.1	0.1
No. of Companies Reporting	3	3		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.2	0.1	0.3	0.2
Used in HMA/WMA Mixtures	0.2	0.2	0.2	0.3
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.12	0.10	0.18	0.17
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	20.3%	26.7%		
Average % for Other Agency Mixtures <sup>1</sup>	20.3%	23.3%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	21.9%	20.0%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			20.0%	23.1%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	67%	67%		
% of RAP Mixtures Using Softer Binders	0%	0%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	0.0	0.0	0.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	0%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.0	0.0
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.0
DOT	0%	0%	0.0	0.0
Other Agency	0%	0%	0.0	0.0
Commercial & Residential	0%	0%	0.0	0.0
	Other Reported Data			
Chemical Additive, % of Market	0%	0%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	0%	0%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	0%	0%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.



Numbers may not add up exactly due to rounding

IDAHO	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	1.7	1.5	2.8	2.9
DOT	1.0	0.8	1.7	1.5
Other Agency	0.2	0.4	0.4	0.8
Commercial & Residential	0.5	0.3	0.7	0.6
No. of Companies Reporting	6	5		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.6	0.5	1.0	0.9
Used in HMA/WMA Mixtures	0.5	0.4	0.8	0.8
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.53	0.73	0.86	1.41
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	25.8%	26.0%		
Average % for Other Agency Mixtures <sup>1</sup>	27.3%	27.4%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	31.3%	32.2%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			27.3%	27.3%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	17%	28%		
% of RAP Mixtures Using Softer Binders	79%	79%		
% of RAP Mixtures Using Rejuvenators	3%	2%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	0.0	0.0	0.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	0%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			1.3	1.5
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.7
DOT	56%	76%	0.9	1.2
Other Agency	36%	95%	0.1	0.7
Commercial & Residential	29%	47%	0.2	0.3
<b>WMA Technologies<sup>‡</sup></b>	Other Reported Data			
Chemical Additive, % of Market	50%	73%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	50%	27%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	67%	80%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

ILLINOIS	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	2.1	3.2	13.0	12.5
DOT	0.9	0.8	5.8	3.1
Other Agency	0.7	1.1	4.1	4.3
Commercial & Residential	0.5	1.3	3.1	5.1
No. of Companies Reporting	7	12		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.5	2.6	3.2	10.2
Used in HMA/WMA Mixtures	0.5	0.9	3.3	3.5
Used as Aggregate	0.0	0.4	0.2	1.4
Used in Cold-Mix Asphalt	0.0	0.0	0.1	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.53	1.00	3.26	3.91
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	24.3%	25.7%		
Average % for Other Agency Mixtures <sup>1</sup>	23.6%	27.0%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	28.7%	29.6%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			25.1%	28.1%
	Other Reported Data			
% Companies Reporting Using RAP	100%	83%		
% of RAP Fractionated	55%	39%		
% of RAP Mixtures Using Softer Binders	14%	23%		
% of RAP Mixtures Using Rejuvenators	1%	3%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	4.0	24.5	24.5	95.7
Processed Shingles Accepted	7.2	57.1	44.3	223.0
Used in HMA/WMA Mixtures	10.1	70.1	62.2	273.8
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	1.1	1.0	6.7	3.9
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.40%	2.33%		
Average % for Other Agency Mixtures <sup>1</sup>	0.60%	2.11%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.60%	2.20%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.48%	2.19%
	Other Reported Data			
% Companies Reporting Using RAS	43%			
% of RAS Mixtures Using Softer Binders	40%			
% of RAS Mixtures Using Rejuvenators	0%			
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			4.5	4.6
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				4.2
DOT	33%	38%	1.9	1.2
Other Agency	41%	84%	1.7	3.6
Commercial & Residential	29%	79%	0.9	4.0
	Other Reported Data			
Chemical Additive, % of Market	50%	21%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	50%	79%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	71%	50%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

INDIANA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	6.6	8.3	11.8	12.5
DOT	2.9	3.4	5.1	5.1
Other Agency	2.2	2.3	4.0	3.5
Commercial & Residential	1.5	2.6	2.7	3.9
No. of Companies Reporting	5	7		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	1.5	1.9	2.7	2.9
Used in HMA/WMA Mixtures	1.5	2.0	2.6	3.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	2.20	2.37	3.94	3.57
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	19.8%	22.0%		
Average % for Other Agency Mixtures <sup>1</sup>	23.8%	23.4%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	24.0%	26.1%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			21.1%	24.1%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	43%	69%		
% of RAP Mixtures Using Softer Binders	22%	8%		
% of RAP Mixtures Using Rejuvenators	0%	8%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	3.6	0.9	6.5	1.4
Processed Shingles Accepted	3.6	8.4	6.4	12.7
Used in HMA/WMA Mixtures	13.2	17.5	23.6	26.4
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	13.8	9.0	24.6	13.6
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.30%	0.22%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.19%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.30%	0.21%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.20%	0.21%
	Other Reported Data			
% Companies Reporting Using RAS	80%	71%		
% of RAS Mixtures Using Softer Binders	25%	10%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			10.4	3.7
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				5.5
DOT	88%	82%	4.5	4.2
Other Agency	88%	56%	3.5	1.9
Commercial & Residential	88%	79%	2.4	3.1
	Other Reported Data			
Chemical Additive, % of Market	0%	0%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	100%	100%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	60%	57%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

IOWA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	1.6	1.8	3.9	3.8
DOT	0.9	1.0	2.1	2.1
Other Agency	0.4	0.6	1.0	1.3
Commercial & Residential	0.3	0.2	0.8	0.4
No. of Companies Reporting	6	4		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.3	0.3	0.8	0.6
Used in HMA/WMA Mixtures	0.2	0.3	0.4	0.7
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.22	0.12	0.51	0.25
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	10.8%	17.0%		
Average % for Other Agency Mixtures <sup>1</sup>	10.8%	19.3%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	10.2%	20.0%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			10.7%	18.3%
	Other Reported Data			
% Companies Reporting Using RAP	83%	100%		
% of RAP Fractionated	0%	1%		
% of RAP Mixtures Using Softer Binders	21%	19%		
% of RAP Mixtures Using Rejuvenators	0%	3%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	7.0	2.5	16.5	5.3
Processed Shingles Accepted	0.7	0.0	1.7	0.0
Used in HMA/WMA Mixtures	4.1	4.2	9.7	8.9
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	19.4	14.5	46.3	30.6
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.30%	0.20%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.27%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.40%	0.27%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.25%	0.23%
	Other Reported Data			
% Companies Reporting Using RAS	33%	50%		
% of RAS Mixtures Using Softer Binders	25%	25%		
% of RAS Mixtures Using Rejuvenators	0%	5%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.4	1.1
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.9
DOT	5%	64%	0.1	1.4
Other Agency	13%	30%	0.1	0.4
Commercial & Residential	20%	69%	0.2	0.3
	Other Reported Data			
Chemical Additive, % of Market	50%	51%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	50%	49%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	33%	75%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

KANSAS	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	1.1	2.4	2.0	2.5
DOT	0.4	1.4	0.8	1.5
Other Agency	0.4	0.5	0.8	0.5
Commercial & Residential	0.3	0.5	0.5	0.5
No. of Companies Reporting	3	4		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.4	1.0	0.7	1.0
Used in HMA/WMA Mixtures	0.2	0.5	0.4	0.5
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.23	0.83	0.43	0.86
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	15.8%	21.3%		
Average % for Other Agency Mixtures <sup>1</sup>	22.2%	17.5%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	19.2%	20.0%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			19.0%	20.8%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	5%	29%		
% of RAP Mixtures Using Softer Binders	65%	68%		
% of RAP Mixtures Using Rejuvenators	3%	15%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	2.0	0.0	2.1
Processed Shingles Accepted	2.5	13.0	4.7	13.5
Used in HMA/WMA Mixtures	5.5	13.0	10.2	13.5
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	11.0	2.0	20.5	2.1
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	1.00%	0.67%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.43%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.51%	0.54%
	Other Reported Data			
% Companies Reporting Using RAS	33%	75%		
% of RAS Mixtures Using Softer Binders	100%	67%		
% of RAS Mixtures Using Rejuvenators	0%	34%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.5	0.7
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.7
DOT	38%	62%	0.3	0.9
Other Agency	19%	50%	0.1	0.3
Commercial & Residential	13%	48%	0.1	0.3
	Other Reported Data			
Chemical Additive, % of Market	88%	58%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	12%	42%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	66%	75%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

<b>KENTUCKY</b>	<b>Reported Values</b>		<b>Estimated Values</b>	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	4.4	4.7	4.3	5.8
DOT	2.1	2.6	2.1	3.2
Other Agency	1.3	1.2	1.3	1.5
Commercial & Residential	1.1	0.9	1.1	1.1
No. of Companies Reporting	4	10		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	1.2	0.8	1.2	1.0
Used in HMA/WMA Mixtures	1.1	0.7	1.1	0.9
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.96	0.97	0.96	1.2
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	24.5%	15.1%		
Average % for Other Agency Mixtures <sup>1</sup>	24.2%	17.3%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	24.5%	15.8%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			24.4%	15.7%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	53%	42%		
% of RAP Mixtures Using Softer Binders	8%	22%		
% of RAP Mixtures Using Rejuvenators	26%	18%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	8.0	0.0	9.9
Processed Shingles Accepted	12.0	13.4	12.0	16.5
Used in HMA/WMA Mixtures	13.9	1.1	13.8	1.4
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	5.5	15.3	5.5	18.9
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.02%		
Average % for Other Agency Mixtures <sup>1</sup>	0.60%	0.02%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.60%	0.02%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.31%	0.02%
	Other Reported Data			
% Companies Reporting Using RAS	50%	20%		
% of RAS Mixtures Using Softer Binders	0%	45%		
% of RAS Mixtures Using Rejuvenators	55%	90%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			3.3	1.6
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				1.3
DOT	77%	65%	1.6	2.1
Other Agency	75%	42%	0.9	0.6
Commercial & Residential	75%	19%	0.8	0.2
	Other Reported Data			
Chemical Additive, % of Market	50%	53%		
Additive Foaming, % of Market	0%	9%		
Plant Foaming, % of Market	50%	38%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	100%	60%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

LOUISIANA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	1.2	0.9	7.8	7.4
DOT	0.6	0.5	4.1	4.1
Other Agency	0.3	0.2	2.0	1.6
Commercial & Residential	0.3	0.2	1.7	1.7
No. of Companies Reporting	5	4		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.3	0.2	1.8	1.8
Used in HMA/WMA Mixtures	0.3	0.2	1.7	1.6
Used as Aggregate	0.0	0.0	0.1	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.17	0.16	1.06	1.32
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	23.5%	23.3%		
Average % for Other Agency Mixtures <sup>1</sup>	16.9%	18.0%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	21.7%	22.3%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			20.3%	22.2%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	75%	95%		
% of RAP Mixtures Using Softer Binders	12%	25%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	0.0	0.0	0.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	0%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			6.3	5.9
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.0
DOT	83%	74%	3.4	3.0
Other Agency	78%	81%	1.6	1.3
Commercial & Residential	81%	90%	1.4	1.6
	Other Reported Data			
Chemical Additive, % of Market	0%	2%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	100%	98%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	80%	100%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

MAINE	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	2.0	*	1.7	1.7
DOT	0.6	*	0.6	*
Other Agency	0.5	*	0.4	*
Commercial & Residential	0.8	*	0.7	*
No. of Companies Reporting	3	*		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.2	*	0.2	*
Used in HMA/WMA Mixtures	0.4	*	0.3	*
Used as Aggregate	0.0	*	0.0	*
Used in Cold-Mix Asphalt	0.0	*	0.0	*
Used in Other	0.0	*	0.0	*
Landfilled	0.0	*	0.0	*
Total Tons of RAP Stockpiled at Year-End	0.53	*	0.46	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	19.8%	*		
Average % for Other Agency Mixtures <sup>1</sup>	19.8%	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	21.8%	*		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			20.3%	*
	Other Reported Data			
% Companies Reporting Using RAP	100%	*		
% of RAP Fractionated	27%	*		
% of RAP Mixtures Using Softer Binders	2%	*		
% of RAP Mixtures Using Rejuvenators	0%	*		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	*	0.0	*
Processed Shingles Accepted	5.9	*	5.1	*
Used in HMA/WMA Mixtures	3.9	*	3.4	*
Used as Aggregate	0.0	*	0.0	*
Used in Cold-Mix Asphalt	0.0	*	0.0	*
Used in Other	0.0	*	0.0	*
Landfilled	0.0	*	0.0	*
Total Tons of RAS Stockpiled at Year-End	1.0	*	0.8	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.60%	*		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	*		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.20%	*
	Other Reported Data			
% Companies Reporting Using RAS	66%	*		
% of RAS Mixtures Using Softer Binders	0%	*		
% of RAS Mixtures Using Rejuvenators	0%	*		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.1	*
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				*
DOT	8%	*	0.0	*
Other Agency	6%	*	0.0	*
Commercial & Residential	4%	*	0.0	*
	Other Reported Data			
Chemical Additive, % of Market	33%	*		
Additive Foaming, % of Market	0%	*		
Plant Foaming, % of Market	0%	*		
Organic Additive, % of Market	67%	*		
% Companies Reporting Using WMA Technologies	100%	*		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.



Numbers may not add up exactly due to rounding

MARYLAND	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	2.4	4.4	7.8	6.8
DOT	1.2	1.5	3.9	2.3
Other Agency	0.5	1.1	1.5	1.7
Commercial & Residential	0.7	1.8	2.4	2.8
No. of Companies Reporting	6	11		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.7	1.6	2.2	2.5
Used in HMA/WMA Mixtures	0.5	1.2	1.8	1.8
Used as Aggregate	0.0	0.3	0.1	0.5
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.71	1.02	2.29	1.58
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	21.6%	23.2%		
Average % for Other Agency Mixtures <sup>1</sup>	21.2%	21.3%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	24.6%	29.3%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			22.5%	26.4%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	0%	14%		
% of RAP Mixtures Using Softer Binders	29%	19%		
% of RAP Mixtures Using Rejuvenators	16%	4%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.5	3.0	1.6	4.6
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	7.1	0.0	22.7	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	10.5	3.0	33.8	4.6
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.50%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.29%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	33%	0%		
% of RAS Mixtures Using Softer Binders	25%	0%		
% of RAS Mixtures Using Rejuvenators	15%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			2.7	3.2
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.6
DOT	36%	72%	1.4	1.7
Other Agency	40%	59%	0.6	1.0
Commercial & Residential	30%	40%	0.7	1.1
<b>WMA Technologies<sup>‡</sup></b>	Other Reported Data			
Chemical Additive, % of Market	20%	36%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	80%	64%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	83%	55%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

MASSACHUSETTS	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	5.0	5.0	6.5	6.5
DOT	2.2	1.7	2.8	2.2
Other Agency	0.7	1.3	0.9	1.7
Commercial & Residential	2.1	2.0	2.8	2.6
No. of Companies Reporting	8	7		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.9	1.3	1.2	1.7
Used in HMA/WMA Mixtures	0.8	0.8	1.0	1.0
Used as Aggregate	0.1	0.2	0.1	0.2
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.1	0.0	0.1
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.56	1.28	0.72	1.66
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	20.2%	16.1%		
Average % for Other Agency Mixtures <sup>1</sup>	4.8%	15.1%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	14.5%	16.0%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			15.6%	15.6%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	3%	14%		
% of RAP Mixtures Using Softer Binders	5%	2%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	9.0	24.0	11.7	31.2
Processed Shingles Accepted	2.9	2.3	3.7	3.0
Used in HMA/WMA Mixtures	2.9	2.3	3.7	3.0
Used as Aggregate	15.0	24.0	19.4	31.2
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.8	25.0	1.0	32.5
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.10%	0.07%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.10%	0.07%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.06%	0.05%
	Other Reported Data			
% Companies Reporting Using RAS	25%	29%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			3.8	2.2
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				2.8
DOT	83%	96%	2.3	2.1
Other Agency	8%	43%	0.1	0.8
Commercial & Residential	51%	81%	1.4	2.1
	Other Reported Data			
Chemical Additive, % of Market	75%	78%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	0%	0%		
Organic Additive, % of Market	25%	22%		
% Companies Reporting Using WMA Technologies	100%	100%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

<b>MICHIGAN</b>	<b>Reported Values</b>		<b>Estimated Values</b>	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	9.0	8.8	13.7	14.3
DOT	2.9	2.7	4.3	4.4
Other Agency	2.3	2.1	3.5	3.4
Commercial & Residential	3.9	4.0	5.9	6.5
No. of Companies Reporting	7	5		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	2.8	2.4	4.2	3.9
Used in HMA/WMA Mixtures	2.5	2.5	3.8	4.1
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	3.42	3.17	5.18	5.15
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	21.7%	21.8%		
Average % for Other Agency Mixtures <sup>1</sup>	26.5%	26.2%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	33.3%	34.4%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			27.9%	28.4%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	24%	17%		
% of RAP Mixtures Using Softer Binders	24%	35%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	2.0	2.0	3.0	3.3
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.5	0.5	0.8	0.8
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	1.5	1.5	2.3	2.4
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.01%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.01%	0.01%
	Other Reported Data			
% Companies Reporting Using RAS	14%	20%		
% of RAS Mixtures Using Softer Binders	33%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			2.3	0.1
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				2.4
DOT	17%	29%	0.7	1.3
Other Agency	15%	18%	0.5	0.5
Commercial & Residential	18%	10%	1.1	0.7
	Other Reported Data			
Chemical Additive, % of Market	25%	0%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	75%	100%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	57%	20%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

MINNESOTA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	6.0	6.5	6.9	10.0
DOT	1.7	1.8	2.0	2.8
Other Agency	2.5	3.0	2.9	4.6
Commercial & Residential	1.8	1.7	2.1	2.6
No. of Companies Reporting	4	5		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	1.5	1.9	1.7	2.9
Used in HMA/WMA Mixtures	1.2	1.6	1.3	2.5
Used as Aggregate	0.5	0.8	0.5	1.2
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	1.15	2.13	1.31	3.28
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	17.4%	23.3%		
Average % for Other Agency Mixtures <sup>1</sup>	17.9%	23.5%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	23.6%	27.3%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			19.5%	24.6%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	10%	11%		
% of RAP Mixtures Using Softer Binders	10%	28%		
% of RAP Mixtures Using Rejuvenators	1%	1%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	12.7	0.0	19.5
Processed Shingles Accepted	10.4	0.0	11.9	0.0
Used in HMA/WMA Mixtures	13.9	14.5	15.9	22.3
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	25.3	25.0	28.8	38.5
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.40%	0.18%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.20%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.30%	0.26%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.23%	0.22%
	Other Reported Data			
% Companies Reporting Using RAS	25%	40%		
% of RAS Mixtures Using Softer Binders	5%	20%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			3.4	5.4
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.6
DOT	48%	40%	0.9	1.1
Other Agency	50%	67%	1.4	3.1
Commercial & Residential	48%	69%	1.0	1.8
	Other Reported Data			
Chemical Additive, % of Market	29%	1%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	71%	99%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	100%	80%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

MISSISSIPPI	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	2.8	3.9	4.8	5.5
DOT	1.6	2.2	2.8	3.1
Other Agency	0.7	1.0	1.2	1.4
Commercial & Residential	0.5	0.7	0.8	1.0
No. of Companies Reporting	5	9		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.3	1.1	0.5	1.6
Used in HMA/WMA Mixtures	0.5	0.8	0.9	1.1
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.16	0.49	0.27	0.69
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	18.8%	18.3%		
Average % for Other Agency Mixtures <sup>1</sup>	18.8%	20.2%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	15.8%	21.1%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			18.4%	19.7%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	25%	19%		
% of RAP Mixtures Using Softer Binders	3%	0%		
% of RAP Mixtures Using Rejuvenators	0%	1%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.1	0.0	0.1
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	0.0	0.1	0.1
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	0%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			3.9	1.1
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				3.2
DOT	92%	84%	2.6	2.6
Other Agency	67%	81%	0.8	1.1
Commercial & Residential	67%	58%	0.6	0.6
	Other Reported Data			
Chemical Additive, % of Market	0%	0%		
Additive Foaming, % of Market	0%	3%		
Plant Foaming, % of Market	100%	97%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	60%	89%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

MISSOURI	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	3.9	3.8	6.5	6.5
DOT	1.4	1.2	2.4	2.1
Other Agency	0.7	1.0	1.1	1.7
Commercial & Residential	1.8	1.6	3.0	2.7
No. of Companies Reporting	7	9		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.8	0.8	1.4	1.4
Used in HMA/WMA Mixtures	0.9	0.8	1.5	1.4
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	1.51	1.55	2.53	2.65
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	23.3%	20.8%		
Average % for Other Agency Mixtures <sup>1</sup>	19.1%	20.0%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	23.1%	21.3%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			22.5%	21.1%
	Other Reported Data			
% Companies Reporting Using RAP	100%	89%		
% of RAP Fractionated	10%	16%		
% of RAP Mixtures Using Softer Binders	39%	35%		
% of RAP Mixtures Using Rejuvenators	6%	4%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	41.5	25.0	69.5	42.8
Processed Shingles Accepted	4.4	4.5	7.4	7.7
Used in HMA/WMA Mixtures	10.8	19.0	18.2	32.5
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	78.7	42.4	132.0	72.5
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.50%	0.70%		
Average % for Other Agency Mixtures <sup>1</sup>	0.60%	0.35%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.35%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.28%	0.50%
	Other Reported Data			
% Companies Reporting Using RAS	57%	67%		
% of RAS Mixtures Using Softer Binders	62%	66%		
% of RAS Mixtures Using Rejuvenators	35%	8%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			2.2	1.0
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.2
DOT	33%	26%	0.8	0.5
Other Agency	34%	20%	0.4	0.3
Commercial & Residential	33%	12%	1.0	0.3
	Other Reported Data			
WMA Technologies	Other Reported Data			
Chemical Additive, % of Market	33%	41%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	67%	59%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	71%	22%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

<b>MONTANA</b>	<b>Reported Values</b>		<b>Estimated Values</b>	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	*	*	4.2	4.2
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
No. of Companies Reporting	*	*		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAP Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAP	*	*		
% of RAP Fractionated	*	*		
% of RAP Mixtures Using Softer Binders	*	*		
% of RAP Mixtures Using Rejuvenators	*	*		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	*	*	*	*
Processed Shingles Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAS Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAS	*	*		
% of RAS Mixtures Using Softer Binders	*	*		
% of RAS Mixtures Using Rejuvenators	*	*		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			*	*
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>			*	*
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	*	*		
Additive Foaming, % of Market	*	*		
Plant Foaming, % of Market	*	*		
Organic Additive, % of Market	*	*		
% Companies Reporting Using WMA Technologies	*	*		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

NEBRASKA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	0.5	0.6	2.8	3.0
DOT	0.2	0.3	1.2	1.5
Other Agency	0.2	0.2	0.8	1.0
Commercial & Residential	0.1	0.1	0.8	0.5
No. of Companies Reporting	3	3		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.1	0.2	0.8	1.0
Used in HMA/WMA Mixtures	0.1	0.2	0.5	0.8
Used as Aggregate	0.0	0.1	0.2	0.3
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.22	0.32	1.17	1.60
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	21.3%	25.0%		
Average % for Other Agency Mixtures <sup>1</sup>	18.0%	25.0%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	16.3%	26.7%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			18.8%	25.7%
	Other Reported Data			
% Companies Reporting Using RAP	100%	66%		
% of RAP Fractionated	0%	17%		
% of RAP Mixtures Using Softer Binders	0%	17%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	1.2	0.0	6.0
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	3.3	4.4	17.7	22.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	0%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.0	0.9
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				1.2
DOT	0%	81%	0.0	1.2
Other Agency	0%	55%	0.0	0.5
Commercial & Residential	0%	74%	0.0	0.4
	Other Reported Data			
Chemical Additive, % of Market	0%	100%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	0%	0%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	0%	67%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.



Numbers may not add up exactly due to rounding

NEVADA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	1.3	*	3.4	3.6
DOT	0.4	*	1.1	*
Other Agency	0.2	*	0.5	*
Commercial & Residential	0.7	*	1.8	*
No. of Companies Reporting	3	*		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.2	*	0.4	*
Used in HMA/WMA Mixtures	0.2	*	0.4	*
Used as Aggregate	0.0	*	0.0	*
Used in Cold-Mix Asphalt	0.0	*	0.0	*
Used in Other	0.0	*	0.0	*
Landfilled	0.0	*	0.0	*
Total Tons of RAP Stockpiled at Year-End	0.05	*	0.12	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	8.0%	*		
Average % for Other Agency Mixtures <sup>1</sup>	11.3%	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	14.7%	*		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			12.0%	*
	Other Reported Data			
% Companies Reporting Using RAP	100%	*		
% of RAP Fractionated	33%	*		
% of RAP Mixtures Using Softer Binders	17%	*		
% of RAP Mixtures Using Rejuvenators	0%	*		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.2	*	0.5	*
Processed Shingles Accepted	0.0	*	0.0	*
Used in HMA/WMA Mixtures	0.0	*	0.0	*
Used as Aggregate	0.0	*	0.0	*
Used in Cold-Mix Asphalt	0.0	*	0.0	*
Used in Other	0.0	*	0.0	*
Landfilled	0.0	*	0.0	*
Total Tons of RAS Stockpiled at Year-End	0.2	*	0.4	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	*		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	*		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	*
	Other Reported Data			
% Companies Reporting Using RAS	33%	*		
% of RAS Mixtures Using Softer Binders	0%	*		
% of RAS Mixtures Using Rejuvenators	0%	*		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.3	*
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				*
DOT	0%	*	0.0	*
Other Agency	0%	*	0.0	*
Commercial & Residential	14%	*	0.3	*
	Other Reported Data			
Chemical Additive, % of Market	0%	*		
Additive Foaming, % of Market	0%	*		
Plant Foaming, % of Market	100%	*		
Organic Additive, % of Market	0%	*		
% Companies Reporting Using WMA Technologies	66%	*		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

NEW HAMPSHIRE	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	2.5	1.7	3.0	1.7
DOT	0.6	0.5	0.7	0.5
Other Agency	0.6	0.3	0.8	0.3
Commercial & Residential	1.2	0.9	1.5	0.9
No. of Companies Reporting	4	4		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.5	0.3	0.6	0.3
Used in HMA/WMA Mixtures	0.5	0.3	0.7	0.3
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	1.01	0.15	1.23	0.15
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	25.8%	20.8%		
Average % for Other Agency Mixtures <sup>1</sup>	17.0%	13.0%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	23.0%	18.5%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			22.1%	17.6%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	0%	0%		
% of RAP Mixtures Using Softer Binders	0%	0%		
% of RAP Mixtures Using Rejuvenators	25%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	3.1	1.4	3.8	1.4
Used in HMA/WMA Mixtures	3.1	1.4	3.7	1.4
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	0.0	0.0	0.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.30%	0.10%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.30%	0.10%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.12%	0.08%
	Other Reported Data			
% Companies Reporting Using RAS	50%	50%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			1.3	0.1
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.9
DOT	52%	86%	0.4	0.4
Other Agency	17%	67%	0.1	0.2
Commercial & Residential	50%	44%	0.8	0.4
	Other Reported Data			
WMA Technologies	Other Reported Data			
Chemical Additive, % of Market	33%	11%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	29%	69%		
Organic Additive, % of Market	38%	20%		
% Companies Reporting Using WMA Technologies	75%	75%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

NEW JERSEY	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	4.0	4.0	10.2	10.2
DOT	0.5	0.4	1.3	1.0
Other Agency	2.1	2.3	5.4	5.9
Commercial & Residential	1.4	1.3	3.5	3.3
No. of Companies Reporting	3	3		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	1.2	1.5	3.2	3.8
Used in HMA/WMA Mixtures	0.8	0.7	2.0	1.8
Used as Aggregate	0.0	0.2	0.1	0.6
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	5.91	4.24	15.05	10.81
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	10.8%	13.3%		
Average % for Other Agency Mixtures <sup>1</sup>	16.7%	17.7%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	26.2%	25.0%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			19.3%	17.5%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	12%	0%		
% of RAP Mixtures Using Softer Binders	0%	2%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	0.0	0.0	0.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	0%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.3	0.0
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				5.4
DOT	0%	46%	0.0	0.5
Other Agency	3%	61%	0.2	3.6
Commercial & Residential	3%	40%	0.1	1.3
	Other Reported Data			
Chemical Additive, % of Market	55%	0%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	45%	100%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	67%	67%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

NEW MEXICO	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	0.9	0.7	3.0	3.8
DOT	0.2	0.1	0.5	0.5
Other Agency	0.3	0.3	1.0	1.6
Commercial & Residential	0.4	0.3	1.4	1.6
No. of Companies Reporting	3	3		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.3	0.2	0.8	1.3
Used in HMA/WMA Mixtures	0.2	0.1	0.6	0.7
Used as Aggregate	0.0	0.0	0.0	0.1
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.10	0.14	0.31	0.78
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	17.7%	14.7%		
Average % for Other Agency Mixtures <sup>1</sup>	19.4%	17.0%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	22.7%	19.7%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			20.6%	18.6%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	37%	40%		
% of RAP Mixtures Using Softer Binders	8%	0%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	5.0	0.0	16.0	0.0
Used in HMA/WMA Mixtures	3.1	0.0	9.9	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	1.8	0.0	5.8	0.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.70%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.33%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	33%	0%		
% of RAS Mixtures Using Softer Binders	50%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.1	0.5
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.1
DOT	2%	31%	0.0	0.2
Other Agency	5%	26%	0.0	0.4
Commercial & Residential	5%	1%	0.0	0.0
	Other Reported Data			
Chemical Additive, % of Market	17%	16%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	83%	84%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	67%	67%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

NEW YORK	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	7.3	5.8	16.5	17.0
DOT	2.5	2.0	5.6	5.9
Other Agency	2.6	2.1	5.8	6.2
Commercial & Residential	2.3	1.7	5.1	5.0
No. of Companies Reporting	11	12		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	1.0	0.7	2.3	2.1
Used in HMA/WMA Mixtures	1.2	1.0	2.7	2.9
Used as Aggregate	0.0	0.0	0.0	0.1
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.1
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	1.07	2.02	2.40	5.92
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	15.6%	17.7%		
Average % for Other Agency Mixtures <sup>1</sup>	16.0%	16.6%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	17.3%	18.0%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			16.2%	17.2%
	Other Reported Data			
% Companies Reporting Using RAP	100%	92%		
% of RAP Fractionated	14%	20%		
% of RAP Mixtures Using Softer Binders	4%	2%		
% of RAP Mixtures Using Rejuvenators	9%	8%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.1	0.0	0.1	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	0.0	0.0	0.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	9%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			2.5	2.9
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				3.4
DOT	18%	45%	1.0	2.6
Other Agency	11%	44%	0.6	2.7
Commercial & Residential	16%	18%	0.8	0.9
	Other Reported Data			
Chemical Additive, % of Market	40%	23%		
Additive Foaming, % of Market	0%	3%		
Plant Foaming, % of Market	60%	74%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	73%	75%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

NORTH CAROLINA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	6.4	7.2	16.0	20.0
DOT	4.3	4.9	10.8	13.6
Other Agency	0.6	0.8	1.5	2.2
Commercial & Residential	1.5	1.5	3.8	4.2
No. of Companies Reporting	7	7		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	1.3	2.2	3.3	6.1
Used in HMA/WMA Mixtures	1.1	1.9	2.8	5.3
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	1.02	1.14	2.55	3.17
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	17.8%	26.8		
Average % for Other Agency Mixtures <sup>1</sup>	13.6%	25.4		
Average % for Commercial & Residential Mixtures <sup>1</sup>	19.0%	25.9		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			17.8%	26.4
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	29%	21%		
% of RAP Mixtures Using Softer Binders	44%	19%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	74.0	75.0	185.6	208.3
Processed Shingles Accepted	9.4	30.8	23.5	85.6
Used in HMA/WMA Mixtures	82.0	59.0	205.8	163.9
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	75.2	131.3	188.6	364.7
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	1.40%	1.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.90%	0.70%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.90%	0.70%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			1.29%	0.82%
	Other Reported Data			
% Companies Reporting Using RAS	57%	43%		
% of RAS Mixtures Using Softer Binders	60%	100%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			5.9	0.4
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				2.1
DOT	55%	13%	5.9	1.8
Other Agency	0%	25%	0.0	0.6
Commercial & Residential	0%	5%	0.0	0.2
	Other Reported Data			
Chemical Additive, % of Market	100%	100%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	0%	0%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	29%	14%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

NORTH DAKOTA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	1.2	*	2.7	2.8
DOT	0.7	*	1.5	*
Other Agency	0.3	*	0.8	*
Commercial & Residential	0.2	*	0.4	*
No. of Companies Reporting	3	*		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.2	*	0.4	*
Used in HMA/WMA Mixtures	0.1	*	0.3	*
Used as Aggregate	0.1	*	0.2	*
Used in Cold-Mix Asphalt	0.0	*	0.0	*
Used in Other	0.0	*	0.0	*
Landfilled	0.0	*	0.0	*
Total Tons of RAP Stockpiled at Year-End	0.15	*	0.34	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	11.8%	*		
Average % for Other Agency Mixtures <sup>1</sup>	11.8%	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	12.8%	*		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			11.9%	*
	Other Reported Data			
% Companies Reporting Using RAP	67%	*		
% of RAP Fractionated	0%	*		
% of RAP Mixtures Using Softer Binders	3%	*		
% of RAP Mixtures Using Rejuvenators	0%	*		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	*	0.0	*
Processed Shingles Accepted	0.0	*	0.0	*
Used in HMA/WMA Mixtures	0.0	*	0.0	*
Used as Aggregate	0.0	*	0.0	*
Used in Cold-Mix Asphalt	0.0	*	0.0	*
Used in Other	0.0	*	0.0	*
Landfilled	0.0	*	0.0	*
Total Tons of RAS Stockpiled at Year-End	0.0	*	0.0	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	*		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	*		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	*
	Other Reported Data			
% Companies Reporting Using RAS	0%	*		
% of RAS Mixtures Using Softer Binders	0%	*		
% of RAS Mixtures Using Rejuvenators	0%	*		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.2	*
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				*
DOT	8%	*	0.1	*
Other Agency	5%	*	0.0	*
Commercial & Residential	10%	*	0.0	*
	Other Reported Data			
Chemical Additive, % of Market	87%	*		
Additive Foaming, % of Market	0%	*		
Plant Foaming, % of Market	13%	*		
Organic Additive, % of Market	0%	*		
% Companies Reporting Using WMA Technologies	67%	*		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

NORTHERN MARIANA ISLANDS	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	NCR	NCR	0.03	0.03
DOT	NCR	NCR	NCR	NCR
Other Agency	NCR	NCR	NCR	NCR
Commercial & Residential	NCR	NCR	NCR	NCR
No. of Companies Reporting	NCR	NCR		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	NCR	NCR	NCR	NCR
Used in HMA/WMA Mixtures	NCR	NCR	NCR	NCR
Used as Aggregate	NCR	NCR	NCR	NCR
Used in Cold-Mix Asphalt	NCR	NCR	NCR	NCR
Used in Other	NCR	NCR	NCR	NCR
Landfilled	NCR	NCR	NCR	NCR
Total Tons of RAP Stockpiled at Year-End	NCR	NCR	NCR	NCR
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	NCR	NCR		
Average % for Other Agency Mixtures <sup>1</sup>	NCR	NCR		
Average % for Commercial & Residential Mixtures <sup>1</sup>	NCR	NCR		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			NCR	NCR
	Other Reported Data			
% Companies Reporting Using RAP	NCR	NCR		
% of RAP Fractionated	NCR	NCR		
% of RAP Mixtures Using Softer Binders	NCR	NCR		
% of RAP Mixtures Using Rejuvenators	NCR	NCR		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	NCR	NCR	NCR	NCR
Processed Shingles Accepted	NCR	NCR	NCR	NCR
Used in HMA/WMA Mixtures	NCR	NCR	NCR	NCR
Used as Aggregate	NCR	NCR	NCR	NCR
Used in Cold-Mix Asphalt	NCR	NCR	NCR	NCR
Used in Other	NCR	NCR	NCR	NCR
Landfilled	NCR	NCR	NCR	NCR
Total Tons of RAS Stockpiled at Year-End	NCR	NCR	NCR	NCR
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	NCR	NCR		
Average % for Other Agency Mixtures <sup>1</sup>	NCR	NCR		
Average % for Commercial & Residential Mixtures <sup>1</sup>	NCR	NCR		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			NCR	NCR
	Other Reported Data			
% Companies Reporting Using RAS	NCR	NCR		
% of RAS Mixtures Using Softer Binders	NCR	NCR		
% of RAS Mixtures Using Rejuvenators	NCR	NCR		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			NCR	NCR
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				NCR
DOT	NCR	NCR	NCR	NCR
Other Agency	NCR	NCR	NCR	NCR
Commercial & Residential	NCR	NCR	NCR	NCR
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	NCR	NCR		
Additive Foaming, % of Market	NCR	NCR		
Plant Foaming, % of Market	NCR	NCR		
Organic Additive, % of Market	NCR	NCR		
% Companies Reporting Using WMA Technologies	NCR	NCR		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.



Numbers may not add up exactly due to rounding

OHIO	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	11.6	12.3	14.8	16.9
DOT	4.4	4.3	5.7	5.9
Other Agency	3.4	4.4	4.3	6.1
Commercial & Residential	3.8	3.6	4.8	4.9
No. of Companies Reporting	7	9		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	2.9	3.4	3.7	4.7
Used in HMA/WMA Mixtures	3.2	3.4	4.1	4.7
Used as Aggregate	0.0	0.1	0.1	0.1
Used in Cold-Mix Asphalt	0.1	0.0	0.1	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	3.58	8.15	4.58	11.20
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	26.6%	27.3%		
Average % for Other Agency Mixtures <sup>1</sup>	27.0%	27.1%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	29.4%	30.4%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			27.6%	28.0%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	25%	7%		
% of RAP Mixtures Using Softer Binders	30%	33%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	7.3	9.8	9.4	13.5
Processed Shingles Accepted	0.0	5.0	0.0	6.9
Used in HMA/WMA Mixtures	4.9	15.9	6.3	21.8
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	55.7	30.2	71.2	41.5
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.10%	0.09%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.17%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.16%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.04%	0.13%
	Other Reported Data			
% Companies Reporting Using RAS	29%	44%		
% of RAS Mixtures Using Softer Binders	33%	71%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			8.2	7.0
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				3.2
DOT	50%	72%	2.8	4.3
Other Agency	57%	54%	2.5	3.3
Commercial & Residential	60%	53%	2.9	2.6
	Other Reported Data			
WMA Technologies	Other Reported Data			
Chemical Additive, % of Market	0%	0%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	100%	100%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	86%	78%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

OKLAHOMA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	2.4	2.2	4.8	4.7
DOT	1.1	1.2	2.1	2.6
Other Agency	0.5	0.3	0.9	0.6
Commercial & Residential	0.9	0.7	1.8	1.5
No. of Companies Reporting	5	6		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.6	0.4	1.3	0.9
Used in HMA/WMA Mixtures	0.4	0.4	0.7	0.8
Used as Aggregate	0.1	0.0	0.2	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.36	0.36	0.72	0.77
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	13.7%	17.0%		
Average % for Other Agency Mixtures <sup>1</sup>	13.3%	17.9%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	16.3%	17.8%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>	13.7%		14.6%	17.3%
	Other Reported Data			
% Companies Reporting Using RAP	100%	83%		
% of RAP Fractionated	65%	52%		
% of RAP Mixtures Using Softer Binders	19%	7%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	52.0	6.3	103.1	13.5
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	9.1	0.8	18.0	1.7
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	8.2	52.5	16.3	112.2
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.05%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	1.00%	0.05%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.37%	0.04%
	Other Reported Data			
% Companies Reporting Using RAS	40%	33%		
% of RAS Mixtures Using Softer Binders	50%	63%		
% of RAS Mixtures Using Rejuvenators	0%	13%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			4.0	2.0
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.4
DOT	75%	44%	1.6	1.1
Other Agency	83%	74%	0.8	0.5
Commercial & Residential	91%	54%	1.6	0.8
	Other Reported Data			
WMA Technologies	Other Reported Data			
Chemical Additive, % of Market	2%	17%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	98%	32%		
Organic Additive, % of Market	0%	51%		
% Companies Reporting Using WMA Technologies	60%	50%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

OREGON	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	1.4	2.2	5.4	5.2
DOT	0.3	0.4	1.1	0.9
Other Agency	0.7	0.7	2.8	1.7
Commercial & Residential	0.4	1.1	1.5	2.6
No. of Companies Reporting	4	4		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.4	0.5	1.4	1.2
Used in HMA/WMA Mixtures	0.3	0.6	1.0	1.4
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.21	0.35	0.78	0.83
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	16.8%	25.0%		
Average % for Other Agency Mixtures <sup>1</sup>	17.6%	26.3%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	19.6%	27.8%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			18.0%	26.8%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	3%	11%		
% of RAP Mixtures Using Softer Binders	0%	3%		
% of RAP Mixtures Using Rejuvenators	0%	3%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.1	11.0	0.4	26.0
Used in HMA/WMA Mixtures	0.1	9.3	0.3	22.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	3.2	1.9	12.3	4.5
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.10%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.35%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.10%	0.60%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.01%	0.42%
	Other Reported Data			
% Companies Reporting Using RAS	50%	25%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	25%	100%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.4	0.5
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.8
DOT	0%	28%	0.0	0.4
Other Agency	7%	32%	0.2	0.5
Commercial & Residential	11%	17%	0.2	0.4
	Other Reported Data			
Chemical Additive, % of Market	0%	1%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	100%	99%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	75%	75%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

PENNSYLVANIA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	7.7	6.3	19.8	20.0
DOT	3.7	3.1	9.6	9.8
Other Agency	1.3	1.3	3.3	4.2
Commercial & Residential	2.7	1.9	7.0	6.0
No. of Companies Reporting	10	8		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	1.8	1.0	4.5	3.2
Used in HMA/WMA Mixtures	1.1	1.0	2.9	3.2
Used as Aggregate	0.0	0.0	0.0	0.1
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	2.71	0.93	7.01	2.95
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	13.8%	15.1%		
Average % for Other Agency Mixtures <sup>1</sup>	14.5%	15.0%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	16.1%	16.3%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			14.7%	15.9%
	Other Reported Data			
% Companies Reporting Using RAP	100%	88%		
% of RAP Fractionated	5%	13%		
% of RAP Mixtures Using Softer Binders	3%	13%		
% of RAP Mixtures Using Rejuvenators	8%	3%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	23.8	35.0	61.3	111.1
Processed Shingles Accepted	9.6	0.0	24.9	0.0
Used in HMA/WMA Mixtures	36.3	49.2	93.7	156.2
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	69.5	33.9	179.4	107.6
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.60%	0.78%		
Average % for Other Agency Mixtures <sup>1</sup>	0.40%	0.78%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.40%	0.78%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.47%	0.78%
	Other Reported Data			
% Companies Reporting Using RAS	40%	13%		
% of RAS Mixtures Using Softer Binders	10%	0%		
% of RAS Mixtures Using Rejuvenators	11%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			15.7	8.6
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				4.6
DOT	94%	73%	9.0	7.2
Other Agency	74%	83%	2.4	3.5
Commercial & Residential	62%	42%	4.3	2.5
	Other Reported Data			
Chemical Additive, % of Market	55%	18%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	45%	82%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	100%	75%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

PUERTO RICO	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	NCR	NCR	1.6	1.7
DOT	NCR	NCR	NCR	NCR
Other Agency	NCR	NCR	NCR	NCR
Commercial & Residential	NCR	NCR	NCR	NCR
No. of Companies Reporting	NCR	NCR		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	NCR	NCR	NCR	NCR
Used in HMA/WMA Mixtures	NCR	NCR	NCR	NCR
Used as Aggregate	NCR	NCR	NCR	NCR
Used in Cold-Mix Asphalt	NCR	NCR	NCR	NCR
Used in Other	NCR	NCR	NCR	NCR
Landfilled	NCR	NCR	NCR	NCR
Total Tons of RAP Stockpiled at Year-End	NCR	NCR	NCR	NCR
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	NCR	NCR		
Average % for Other Agency Mixtures <sup>1</sup>	NCR	NCR		
Average % for Commercial & Residential Mixtures <sup>1</sup>	NCR	NCR		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			NCR	NCR
	Other Reported Data			
% Companies Reporting Using RAP	NCR	NCR		
% of RAP Fractionated	NCR	NCR		
% of RAP Mixtures Using Softer Binders	NCR	NCR		
% of RAP Mixtures Using Rejuvenators	NCR	NCR		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	NCR	NCR	NCR	NCR
Processed Shingles Accepted	NCR	NCR	NCR	NCR
Used in HMA/WMA Mixtures	NCR	NCR	NCR	NCR
Used as Aggregate	NCR	NCR	NCR	NCR
Used in Cold-Mix Asphalt	NCR	NCR	NCR	NCR
Used in Other	NCR	NCR	NCR	NCR
Landfilled	NCR	NCR	NCR	NCR
Total Tons of RAS Stockpiled at Year-End	NCR	NCR	NCR	NCR
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	NCR	NCR		
Average % for Other Agency Mixtures <sup>1</sup>	NCR	NCR		
Average % for Commercial & Residential Mixtures <sup>1</sup>	NCR	NCR		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			NCR	NCR
	Other Reported Data			
% Companies Reporting Using RAS	NCR	NCR		
% of RAS Mixtures Using Softer Binders	NCR	NCR		
% of RAS Mixtures Using Rejuvenators	NCR	NCR		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			NCR	NCR
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				NCR
DOT	NCR	NCR	NCR	NCR
Other Agency	NCR	NCR	NCR	NCR
Commercial & Residential	NCR	NCR	NCR	NCR
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	NCR	NCR		
Additive Foaming, % of Market	NCR	NCR		
Plant Foaming, % of Market	NCR	NCR		
Organic Additive, % of Market	NCR	NCR		
% Companies Reporting Using WMA Technologies	NCR	NCR		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

RHODE ISLAND	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	*	*	2.0	2.1
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
No. of Companies Reporting	*	*		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAP Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAP	*	*		
% of RAP Fractionated	*	*		
% of RAP Mixtures Using Softer Binders	*	*		
% of RAP Mixtures Using Rejuvenators	*	*		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	*	*	*	*
Processed Shingles Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAS Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAS	*	*		
% of RAS Mixtures Using Softer Binders	*	*		
% of RAS Mixtures Using Rejuvenators	*	*		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			*	*
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>			*	*
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	*	*		
Additive Foaming, % of Market	*	*		
Plant Foaming, % of Market	*	*		
Organic Additive, % of Market	*	*		
% Companies Reporting Using WMA Technologies	*	*		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

SOUTH CAROLINA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	3.9	4.1	7.6	7.5
DOT	2.5	2.5	4.9	4.6
Other Agency	0.8	0.7	1.6	1.3
Commercial & Residential	0.5	0.9	1.0	1.6
No. of Companies Reporting	7	6		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.8	0.9	1.5	1.6
Used in HMA/WMA Mixtures	0.8	0.9	1.6	1.7
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.89	1.09	1.74	1.99
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	20.4%	21.9%		
Average % for Other Agency Mixtures <sup>1</sup>	20.7%	23.2%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	21.5%	23.2%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			20.7%	22.4%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	50%	61%		
% of RAP Mixtures Using Softer Binders	0%	29%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.8	0.0	1.5
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	2.5	0.0	4.6
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	0%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			1.5	1.0
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.6
DOT	23%	26%	1.1	1.1
Other Agency	15%	22%	0.2	0.3
Commercial & Residential	15%	13%	0.2	0.2
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	75%	66%		
Additive Foaming, % of Market	0%	34%		
Plant Foaming, % of Market	25%	0%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	71%	100%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

SOUTH DAKOTA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	*	NCR	2.0	2.2
DOT	*	NCR	*	NCR
Other Agency	*	NCR	*	NCR
Commercial & Residential	*	NCR	*	NCR
No. of Companies Reporting	*	NCR		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	*	NCR	*	NCR
Used in HMA/WMA Mixtures	*	NCR	*	NCR
Used as Aggregate	*	NCR	*	NCR
Used in Cold-Mix Asphalt	*	NCR	*	NCR
Used in Other	*	NCR	*	NCR
Landfilled	*	NCR	*	NCR
Total Tons of RAP Stockpiled at Year-End	*	NCR	*	NCR
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	NCR		
Average % for Other Agency Mixtures <sup>1</sup>	*	NCR		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	NCR		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			*	NCR
	Other Reported Data			
% Companies Reporting Using RAP	*	NCR		
% of RAP Fractionated	*	NCR		
% of RAP Mixtures Using Softer Binders	*	NCR		
% of RAP Mixtures Using Rejuvenators	*	NCR		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	*	NCR	*	NCR
Processed Shingles Accepted	*	NCR	*	NCR
Used in HMA/WMA Mixtures	*	NCR	*	NCR
Used as Aggregate	*	NCR	*	NCR
Used in Cold-Mix Asphalt	*	NCR	*	NCR
Used in Other	*	NCR	*	NCR
Landfilled	*	NCR	*	NCR
Total Tons of RAS Stockpiled at Year-End	*	NCR	*	NCR
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	NCR		
Average % for Other Agency Mixtures <sup>1</sup>	*	NCR		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	NCR		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			*	
	Other Reported Data			
% Companies Reporting Using RAS	*	NCR		
% of RAS Mixtures Using Softer Binders	*	NCR		
% of RAS Mixtures Using Rejuvenators	*	NCR		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			*	NCR
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				NCR
DOT	*	NCR	*	NCR
Other Agency	*	NCR	*	NCR
Commercial & Residential	*	NCR	*	NCR
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	*	NCR		
Additive Foaming, % of Market	*	NCR		
Plant Foaming, % of Market	*	NCR		
Organic Additive, % of Market	*	NCR		
% Companies Reporting Using WMA Technologies	*	NCR		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.



Numbers may not add up exactly due to rounding

<b>TENNESSEE</b>	<b>Reported Values</b>		<b>Estimated Values</b>	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	2.5	5.7	9.2	8.9
DOT	0.7	3.6	2.5	5.6
Other Agency	0.4	0.7	1.4	1.1
Commercial & Residential	1.4	1.4	5.2	2.2
No. of Companies Reporting	5	5		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.7	0.6	2.5	0.9
Used in HMA/WMA Mixtures	0.6	1.0	2.1	1.6
Used as Aggregate	0.1	0.1	0.2	0.1
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.87	1.39	3.16	2.17
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	18.6%	16.6%		
Average % for Other Agency Mixtures <sup>1</sup>	23.8%	17.8%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	24.7%	19.5%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			22.8%	17.5%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	55%	22%		
% of RAP Mixtures Using Softer Binders	0%	5%		
% of RAP Mixtures Using Rejuvenators	22%	2%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	20.0	13.1	72.7	20.5
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	15.3	21.1	55.8	32.9
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	54.6	9.6	198.3	15.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.60%	0.35%		
Average % for Other Agency Mixtures <sup>1</sup>	0.60%	0.35%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.60%	0.40%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.61%	0.37%
	Other Reported Data			
% Companies Reporting Using RAS	40%	40%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	33%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			9.2	1.0
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				1.2
DOT	100%	21%	2.5	1.2
Other Agency	100%	40%	1.4	0.5
Commercial & Residential	100%	24%	5.2	0.5
	Other Reported Data			
Chemical Additive, % of Market	20%	82%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	80%	18%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	60%	40%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

TEXAS	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	7.9	7.2	20.0	17.2
DOT	5.4	3.7	13.7	8.8
Other Agency	1.3	2.0	3.2	4.8
Commercial & Residential	1.2	1.5	3.1	3.6
No. of Companies Reporting	7	6		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.9	1.1	2.4	2.6
Used in HMA/WMA Mixtures	1.2	1.2	3.0	2.9
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	2.00	1.68	5.04	4.01
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	14.8%	18.9%		
Average % for Other Agency Mixtures <sup>1</sup>	14.8%	15.6%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	15.1%	18.8%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			14.9%	17.1%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	39%	63%		
% of RAP Mixtures Using Softer Binders	31%	38%		
% of RAP Mixtures Using Rejuvenators	0%	8%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	88.8	48.8	223.9	116.6
Processed Shingles Accepted	28.1	17.6	70.9	42.0
Used in HMA/WMA Mixtures	78.8	55.0	198.8	131.4
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	22.6	15.0	57.1	77.9
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.80%			
Average % for Other Agency Mixtures <sup>1</sup>	1.00%			
Average % for Commercial & Residential Mixtures <sup>1</sup>	1.40%			
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.99%	
	Other Reported Data			
% Companies Reporting Using RAS	100%	83%		
% of RAS Mixtures Using Softer Binders	35%	70%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			9.2	3.6
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				6.1
DOT	50%	61%	6.9	5.4
Other Agency	35%	52%	1.1	2.5
Commercial & Residential	38%	51%	1.2	1.8
	Other Reported Data			
Chemical Additive, % of Market	85%	97%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	15%	3%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	86%	100%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

U.S. VIRGIN ISLANDS	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	NCR	*	0.12	0.12
DOT	NCR	*	NCR	*
Other Agency	NCR	*	NCR	*
Commercial & Residential	NCR	*	NCR	*
No. of Companies Reporting	NCR	*		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	NCR	*	NCR	*
Used in HMA/WMA Mixtures	NCR	*	NCR	*
Used as Aggregate	NCR	*	NCR	*
Used in Cold-Mix Asphalt	NCR	*	NCR	*
Used in Other	NCR	*	NCR	*
Landfilled	NCR	*	NCR	*
Total Tons of RAP Stockpiled at Year-End	NCR	*	NCR	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	NCR	*		
Average % for Other Agency Mixtures <sup>1</sup>	NCR	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	NCR	*		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			NCR	*
	Other Reported Data			
% Companies Reporting Using RAP	NCR	*		
% of RAP Fractionated	NCR	*		
% of RAP Mixtures Using Softer Binders	NCR	*		
% of RAP Mixtures Using Rejuvenators	NCR	*		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	NCR	*	NCR	*
Processed Shingles Accepted	NCR	*	NCR	*
Used in HMA/WMA Mixtures	NCR	*	NCR	*
Used as Aggregate	NCR	*	NCR	*
Used in Cold-Mix Asphalt	NCR	*	NCR	*
Used in Other	NCR	*	NCR	*
Landfilled	NCR	*	NCR	*
Total Tons of RAS Stockpiled at Year-End	NCR	*	NCR	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	NCR	*		
Average % for Other Agency Mixtures <sup>1</sup>	NCR	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	NCR	*		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			NCR	*
	Other Reported Data			
% Companies Reporting Using RAS	NCR	*		
% of RAS Mixtures Using Softer Binders	NCR	*		
% of RAS Mixtures Using Rejuvenators	NCR	*		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			NCR	*
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				*
DOT	NCR	*	NCR	*
Other Agency	NCR	*	NCR	*
Commercial & Residential	NCR	*	NCR	*
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	NCR	*		
Additive Foaming, % of Market	NCR	*		
Plant Foaming, % of Market	NCR	*		
Organic Additive, % of Market	NCR	*		
% Companies Reporting Using WMA Technologies	NCR	*		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

UTAH	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	3.5	3.7	4.0	4.0
DOT	1.1	1.4	1.2	1.5
Other Agency	0.4	0.9	0.4	1.0
Commercial & Residential	2.1	1.4	2.4	1.5
No. of Companies Reporting	9	9		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.6	0.8	0.7	0.9
Used in HMA/WMA Mixtures	0.8	1.0	0.9	1.1
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	1.42	1.43	1.62	1.55
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	15.0%	23.1%		
Average % for Other Agency Mixtures <sup>1</sup>	15.0%	20.2%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	26.7%	33.3%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			21.9%	27.0%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	8%	29%		
% of RAP Mixtures Using Softer Binders	48%	40%		
% of RAP Mixtures Using Rejuvenators	0%	12%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	0.0	0.0	0.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	0%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			3.4	1.6
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				1.9
DOT	84%	94%	1.0	1.4
Other Agency	81%	77%	0.3	0.7
Commercial & Residential	88%	87%	2.1	1.3
<b>WMA Technologies<sup>‡</sup></b>	Other Reported Data			
Chemical Additive, % of Market	34%	16%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	66%	84%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	89%	78%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

VERMONT	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	*	*	1.9	1.9
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
No. of Companies Reporting	*	*		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAP Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAP	*	*		
% of RAP Fractionated	*	*		
% of RAP Mixtures Using Softer Binders	*	*		
% of RAP Mixtures Using Rejuvenators	*	*		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	*	*	*	*
Processed Shingles Accepted	*	*	*	*
Used in HMA/WMA Mixtures	*	*	*	*
Used as Aggregate	*	*	*	*
Used in Cold-Mix Asphalt	*	*	*	*
Used in Other	*	*	*	*
Landfilled	*	*	*	*
Total Tons of RAS Stockpiled at Year-End	*	*	*	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	*	*		
Average % for Other Agency Mixtures <sup>1</sup>	*	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	*	*		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			*	*
	Other Reported Data			
% Companies Reporting Using RAS	*	*		
% of RAS Mixtures Using Softer Binders	*	*		
% of RAS Mixtures Using Rejuvenators	*	*		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			*	*
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>			*	*
DOT	*	*	*	*
Other Agency	*	*	*	*
Commercial & Residential	*	*	*	*
<b>WMA Technologies</b>	Other Reported Data			
Chemical Additive, % of Market	*	*		
Additive Foaming, % of Market	*	*		
Plant Foaming, % of Market	*	*		
Organic Additive, % of Market	*	*		
% Companies Reporting Using WMA Technologies	*	*		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

VIRGINIA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	4.9	5.1	12.0	11.0
DOT	2.1	2.2	5.2	4.7
Other Agency	0.8	1.1	2.1	2.4
Commercial & Residential	2.0	1.8	4.8	3.9
No. of Companies Reporting	5	7		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	1.5	1.7	3.7	3.7
Used in HMA/WMA Mixtures	1.6	1.4	3.9	3.0
Used as Aggregate	0.1	0.1	0.1	0.3
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.1	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	1.47	1.81	3.58	3.90
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	31.9%	26.5%		
Average % for Other Agency Mixtures <sup>1</sup>	32.3%	26.0%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	33.1%	29.0%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			32.4%	27.5%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	36%	26%		
% of RAP Mixtures Using Softer Binders	14%	5%		
% of RAP Mixtures Using Rejuvenators	4%	1%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.0	0.0	0.0	0.1
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	2.0	0.0	4.9	0.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>	0.00%		0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	0%	14%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			7.7	3.6
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				3.0
DOT	69%	69%	3.6	3.3
Other Agency	52%	46%	1.1	1.1
Commercial & Residential	64%	58%	3.1	2.3
	Other Reported Data			
Chemical Additive, % of Market	27%	47%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	73%	53%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	100%	71%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

WASHINGTON	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	4.5	5.5	6.0	5.9
DOT	0.9	0.9	1.2	1.0
Other Agency	1.6	1.9	2.2	2.0
Commercial & Residential	1.9	2.7	2.6	2.9
No. of Companies Reporting	7	9		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.9	1.2	1.3	1.3
Used in HMA/WMA Mixtures	0.9	1.3	1.2	1.4
Used as Aggregate	0.0	0.1	0.1	0.1
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.87	1.02	1.18	1.09
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	17.0%	20.1%		
Average % for Other Agency Mixtures <sup>1</sup>	18.4%	18.7%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	22.4%	25.8%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			19.9%	23.6%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	14%	12%		
% of RAP Mixtures Using Softer Binders	16%	19%		
% of RAP Mixtures Using Rejuvenators	7%	9%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	7.8	14.7	10.5	15.8
Processed Shingles Accepted	2.8	0.0	3.8	0.0
Used in HMA/WMA Mixtures	11.9	14.5	16.0	15.6
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	2.9	7.2	3.9	7.7
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.19%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.19%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.60%	0.36%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.27%	0.26%
	Other Reported Data			
% Companies Reporting Using RAS	43%	33%		
% of RAS Mixtures Using Softer Binders	17%	33%		
% of RAS Mixtures Using Rejuvenators	17%	7%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			1.0	0.4
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				1.1
DOT	5%	14%	0.1	0.1
Other Agency	19%	23%	0.4	0.5
Commercial & Residential	22%	33%	0.6	0.9
	Other Reported Data			
Chemical Additive, % of Market	42%	5%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	58%	95%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	86%	56%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

WEST VIRGINIA	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	1.5	2.5	2.6	3.5
DOT	1.2	2.2	2.0	3.1
Other Agency	0.1	0.2	0.1	0.3
Commercial & Residential	0.3	0.1	0.5	0.1
No. of Companies Reporting	4	3		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.3	1.1	0.5	1.5
Used in HMA/WMA Mixtures	0.3	0.5	0.5	0.7
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	0.32	0.56	0.55	0.78
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	17.5%	20.0%		
Average % for Other Agency Mixtures <sup>1</sup>	15.5%	20.0%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	18.0%	20.0%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			17.6%	20.0%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	4%	0%		
% of RAP Mixtures Using Softer Binders	3%	0%		
% of RAP Mixtures Using Rejuvenators	0%	0%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	0.0	0.0	0.0
Processed Shingles Accepted	0.0	0.0	0.0	0.0
Used in HMA/WMA Mixtures	0.0	0.0	0.0	0.0
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	0.0	0.0	0.0	0.0
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	0.00%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	0.00%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	0.00%
	Other Reported Data			
% Companies Reporting Using RAS	0%	0%		
% of RAS Mixtures Using Softer Binders	0%	0%		
% of RAS Mixtures Using Rejuvenators	0%	0%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.0	0.0
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				0.0
DOT	0%	0%	0.0	0.0
Other Agency	0%	0%	0.0	0.0
Commercial & Residential	0%	0%	0.0	0.0
	Other Reported Data			
WMA Technologies				
Chemical Additive, % of Market	0%	0%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	0%	0%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	0%	0%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.



Numbers may not add up exactly due to rounding

WISCONSIN	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	8.7	9.2	12.0	12.5
DOT	5.3	4.2	7.2	5.7
Other Agency	1.5	2.2	2.0	3.0
Commercial & Residential	2.0	2.8	2.8	3.8
No. of Companies Reporting	4	6		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	1.5	1.3	2.1	1.8
Used in HMA/WMA Mixtures	1.4	1.6	1.9	2.2
Used as Aggregate	0.0	0.1	0.0	0.1
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAP Stockpiled at Year-End	1.16	1.87	1.60	2.54
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	15.6%	14.2%		
Average % for Other Agency Mixtures <sup>1</sup>	16.3%	19.5%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	17.3%	19.3%		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			16.1%	17.4%
	Other Reported Data			
% Companies Reporting Using RAP	100%	100%		
% of RAP Fractionated	4%	5%		
% of RAP Mixtures Using Softer Binders	19%	21%		
% of RAP Mixtures Using Rejuvenators	5%	3%		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	52.0	80.4	71.4	109.2
Processed Shingles Accepted	16.8	15.8	23.1	21.5
Used in HMA/WMA Mixtures	66.2	59.9	90.8	81.4
Used as Aggregate	0.0	0.0	0.0	0.0
Used in Cold-Mix Asphalt	0.0	0.0	0.0	0.0
Used in Other	0.0	0.0	0.0	0.0
Landfilled	0.0	0.0	0.0	0.0
Total Tons of RAS Stockpiled at Year-End	45.7	129.4	62.7	175.8
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.90%	0.50%		
Average % for Other Agency Mixtures <sup>1</sup>	1.50%	0.73%		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.30%	0.73%		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.76%	0.65%
	Other Reported Data			
% Companies Reporting Using RAS	100%	100%		
% of RAS Mixtures Using Softer Binders	53%	55%		
% of RAS Mixtures Using Rejuvenators	10%	7%		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			0.6	2.4
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				1.0
DOT	3%	41%	0.2	2.3
Other Agency	11%	17%	0.2	0.6
Commercial & Residential	5%	13%	0.1	0.5
	Other Reported Data			
Chemical Additive, % of Market	100%	100%		
Additive Foaming, % of Market	0%	0%		
Plant Foaming, % of Market	0%	0%		
Organic Additive, % of Market	0%	0%		
% Companies Reporting Using WMA Technologies	100%	67%		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.

Numbers may not add up exactly due to rounding

WYOMING	Reported Values		Estimated Values	
	2017	2018	2017	2018
<b>Tons of HMA/WMA Produced</b>	Tons, Millions		Tons, Millions	
Total	0.1	*	2.5	2.5
DOT	0.1	*	1.0	*
Other Agency	0.0	*	0.5	*
Commercial & Residential	0.1	*	1.0	*
No. of Companies Reporting	3	*		
<b>RAP</b>	Tons, Millions		Tons, Millions	
Accepted	0.0	*	0.4	*
Used in HMA/WMA Mixtures	0.0	*	0.3	*
Used as Aggregate	0.0	*	0.0	*
Used in Cold-Mix Asphalt	0.0	*	0.0	*
Used in Other	0.0	*	0.0	*
Landfilled	0.0	*	0.0	*
Total Tons of RAP Stockpiled at Year-End	0.02	*	0.40	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	2.5%	*		
Average % for Other Agency Mixtures <sup>1</sup>	17.5%	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	17.5%	*		
State Average All Mixtures Based on RAP Tons Used in HMA/WMA <sup>2</sup>			11.7%	*
	Other Reported Data			
% Companies Reporting Using RAP	67%	*		
% of RAP Fractionated	50%	*		
% of RAP Mixtures Using Softer Binders	0%	*		
% of RAP Mixtures Using Rejuvenators	0%	*		
<b>RAS</b>	Tons, Thousands		Tons, Thousands	
Unprocessed Shingles Accepted	0.0	*	0.0	*
Processed Shingles Accepted	0.0	*	0.0	*
Used in HMA/WMA Mixtures	0.0	*	0.0	*
Used as Aggregate	0.0	*	0.0	*
Used in Cold-Mix Asphalt	0.0	*	0.0	*
Used in Other	0.0	*	0.0	*
Landfilled	0.0	*	0.0	*
Total Tons of RAS Stockpiled at Year-End	0.0	*	0.0	*
	Avg. % Used in Mixtures		Avg. % Used in Mixtures	
Average % for DOT Mixtures <sup>1</sup>	0.00%	*		
Average % for Other Agency Mixtures <sup>1</sup>	0.00%	*		
Average % for Commercial & Residential Mixtures <sup>1</sup>	0.00%	*		
State Average All Mixtures Based on RAS Tons Used in HMA/WMA <sup>2</sup>			0.00%	*
	Other Reported Data			
% Companies Reporting Using RAS	0%	*		
% of RAS Mixtures Using Softer Binders	0%	*		
% of RAS Mixtures Using Rejuvenators	0%	*		
<b>WMA</b>	% of Total Production		Tons, Millions	
Total Tons Produced With WMA Technology at Reduced Temperature <sup>†</sup>			1.6	*
Total Tons Produced With WMA Technology at HMA Temperatures <sup>†</sup>				*
DOT	10%	*	0.1	*
Other Agency	95%	*	0.5	*
Commercial & Residential	100%	*	1.0	*
	Other Reported Data			
Chemical Additive, % of Market	5%	*		
Additive Foaming, % of Market	0%	*		
Plant Foaming, % of Market	95%	*		
Organic Additive, % of Market	0%	*		
% Companies Reporting Using WMA Technologies	67%	*		

<sup>1</sup> Average percent based on contractor's reported percentage for each sector, adjusted based upon reported tonnage.

<sup>2</sup> Average percent based on total reported tons of RAP or RAS used in HMA/WMA divided by reported total tons HMA/WMA produced.

<sup>†</sup> For the 2018 construction season, respondents were specifically asked to disaggregate use of WMA technology at HMA temperatures.





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## **9<sup>th</sup> Annual Asphalt Pavement Industry Survey IS 138 — Appendix B**

