

Information Series 138

# **2<sup>nd</sup> Annual Asphalt Pavement Industry Survey on Reclaimed Asphalt Pavement, Reclaimed Asphalt Shingles, and Warm-Mix Asphalt Usage: 2009–2011**



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**2<sup>nd</sup> Annual Asphalt Pavement Industry Survey**

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16. Abstract <p>One of the shared goals of the Federal Highway Administration (FHWA) and the National Asphalt Pavement Association (NAPA) is to support and promote sustainable practices such as pavement recycling and warm-mix asphalt (WMA). The use of recycled materials, such reclaimed asphalt pavement (RAP) and reclaimed asphalt shingles (RAS), in asphalt pavements reduces the amount of new materials required to produce asphalt mixes and materials going to landfills. This is vital to the mission of environmental stewardship and extending the service life of the nation's infrastructure while lowering overall costs.</p> <p>WMA technologies have been introduced to reduce the mixing and compacting temperatures for asphalt mixtures as a means of reducing emissions. Additional benefits include improved compaction of asphalt mixtures leading to improved pavement performance. As part of FHWA's Every Day Counts initiative, WMA was chosen for accelerated deployment in federal-aid highway, state department of transportation (DOT), and local road projects.</p> <p>It is important that the industry track the deployment of these technologies that reduce costs, energy, waste, emissions, and the amount of new materials required for road construction. FHWA has established two survey mechanisms for tracking the use of recycled materials and WMA in asphalt pavements. The first survey tracks state DOT usage and the other tracks industry usage. These have established a baseline of RAP, RAS, and WMA usage and tracked the growth of the use of these sustainable practices in the highway industry.</p> <p>The objective of this survey was to quantify the use of RAP, RAS, and WMA produced by the asphalt pavement industry. Survey results show significant growth in the use of RAP, RAS, and WMA technologies from 2009 through 2011. The asphalt industry remains the country's number one recycler by recycling asphalt pavements at a rate of over 99 percent and almost all (98 percent) contractors/ branches reported using RAP in 2011. The amount of RAP used in asphalt mixtures has increased by 19 percent, from 56 million tons in 2009 to 66.7 million tons in 2011. Assuming 5 percent liquid asphalt in RAP, this represents over 3.3 million tons (19 million barrels) of asphalt binder conserved. The estimated savings at \$600 per ton for asphalt binder is \$1.98 billion.</p> <p>Use of RAS (both manufacturers' scrap and post-consumer shingles) increased 70 percent from 2009 to 1.2 million tons 2011. Assuming a conservative asphalt content of 20 percent for the RAS, this represents 380,000 tons (2.2 million barrels) of asphalt binder conserved. The estimated savings at \$600 per ton for asphalt binder is \$228 million.</p> <p>In 2011, WMA was about 19 percent of the total asphalt mixture market. WMA use increased by 67 percent from 2010 to 2011, and over 300 percent since 2009. Plant foaming is used most often in producing WMA, with about 95 percent of the market. WMA additives accounted for 5 percent of the market.</p>			
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## Executive Summary

The 2011 survey results show that the asphalt pavement industry continues to improve its outstanding record of sustainable practices by further increasing the use of recycled materials and warm-mix asphalt (WMA). The use of recycled materials such as reclaimed asphalt pavement (RAP) and reclaimed asphalt shingles (RAS) conserve raw materials and reduce overall asphalt mixture costs while WMA technologies improve conditions for achieving performance and long life, conserve energy, reduce emissions from production and paving operations, and improve conditions for workers.

The objective of this survey was to quantify the use of RAP, RAS, and WMA produced by the asphalt pavement industry. The National Asphalt Pavement Association (NAPA) conducted a voluntary survey of asphalt mixture producers in the United States and State Asphalt Pavement Association (SAPAs). The survey was broken into four sections: general information, RAP, RAS, and WMA. Asphalt mix producers from 49 states and Puerto Rico completed the 2011 survey. No survey information was available for the District of Columbia or Delaware. A total of 203 companies/branches with 1,091 plants are represented in the 2011 survey. The following are highlights of the 2011 survey:

- The asphalt industry remains the country's number one recycler by recycling asphalt pavements at a rate of over 99 percent. About 98 percent of the contractors/branches reported using RAP in 2011, up slightly from 96 percent in 2010. The amount of RAP used in asphalt mixtures was 66.7 million tons in 2011, a 19 percent increase over the tons used in 2009 (56 million tons) and about a 7 percent increase over the tons used in 2010 (62.1 million tons). Assuming 5 percent liquid asphalt in RAP, this represents over 3.3 million tons (19 million barrels) of asphalt binder conserved. Similar to 2010, less than 1 percent of RAP was sent to landfills.
- Use of RAS (both manufacturers' scrap and post-consumer shingles) increased from 1.1 million tons in 2010 to 1.2 million tons in 2011, an 8 percent increase. Assuming a conservative asphalt content of 20 percent for the RAS, this represents 380,000 tons (2.2 million barrels) of asphalt binder conserved.
- Total tonnage of WMA is estimated at 68.7 million tons in 2011. This was a 67 percent increase over 2010 WMA tonnage (41.1 million tons). In 2011, WMA was about 19 percent of the total asphalt mixture market. Plant foaming is used most often in producing WMA, with about 95 percent of the market; additives accounted for 5 percent of the market.

## Background

One of the shared goals of the Federal Highway Administration (FHWA) and the National Asphalt Pavement Association (NAPA) is to support and promote sustainable practices such as incorporating recycled materials in pavements and warm-mix asphalt (WMA). Reclaimed asphalt pavement (RAP) ranks as the single most recycled material in the United States and is vital to the mission of extending the service life of the nation's infrastructure while lowering overall costs. Another recycled material increasingly used in asphalt mixtures is reclaimed asphalt shingles (RAS) from both manufacturers' waste and post-consumer shingles. The use of RAP and RAS in asphalt pavements reduces the amount of materials going to landfills and can reduce the amount of new asphalt binder required in mixes, which helps to stabilize the price of asphalt mixtures.

WMA technologies reduce the mixing and compacting temperatures for asphalt mixtures. Environmental benefits include reductions in both fuel consumption and air emissions. Construction benefits include the ability to extend the paving season into the cooler months, haul the material longer distances, improve compaction, and use higher percentages of RAP (Prowell, et al., 2012). As part of FHWA's Every Day Counts initiative, WMA was chosen for accelerated deployment in federal-aid highway, state department of transportation (DOT), and local road projects.

FHWA works closely with the pavement industry through associations and other stakeholders to promote pavement recycling technologies and WMA. As part of this effort, FHWA has established two survey mechanisms for tracking the use of recycled materials and WMA in asphalt pavements. The first survey tracks state DOT usage and the other tracks industry usage. Since 2007, FHWA has partnered with the American Association of State Highway and Transportation Officials (AASHTO) to conduct a biennial survey of state DOTs' use of recycled materials (Copeland, 2011; Copeland, et al., 2010; Pappas, 2011) (Copeland, 2011) (Copeland, et al., 2010) (Pappas, 2011). The results of the FHWA/AASHTO survey are typically presented at FHWA Expert Task Group meetings. FHWA partners with NAPA to conduct the survey of asphalt producers to determine industry use of RAP, RAS, and WMA technologies. Both surveys have established a baseline of RAP, RAS, and WMA usage and tracked the growth of the use of these sustainable practices in the highway industry.

The FHWA/NAPA industry survey first began in 2010. The survey results showed significant growth in the use of RAP, RAS, and WMA technologies from 2009 to 2010 (Hansen & Newcomb, 2011). In order to continue to track the use of these technologies, FHWA again partnered with NAPA to conduct a similar survey of RAP, RAS, and WMA use for 2011. This report documents the 2011 industry survey results including the survey methodology, results, trends, and changes from 2009 through 2011. The survey questions and data by state are included in the appendices.

## Objective and Scope

The objective of this effort is to quantify the use of RAP, RAS, and WMA produced by the asphalt pavement industry. NAPA conducted a voluntary survey of asphalt mixture producers in the United States and of state asphalt pavement associations (SAPAs). While keeping specific producer data confidential, NAPA staff compiled the amount of asphalt mixtures being produced, the amount of RAP and RAS used, and the amount of WMA being produced in the United States. The data are broken out on a state-by-state basis in Appendix B. The data are analyzed and summarized in this report.

In order to accomplish this work, the following tasks were conducted:

1. Develop a survey similar to the 2009–2010 survey that enables an analysis of the quantities of RAP and RAS being used in asphalt mixtures, as well as the total amount of WMA produced nationally.
2. Conduct a voluntary survey of asphalt mix producers throughout the United States and follow up with verbal requests for information in locations where responses were low.
3. Estimate the total asphalt mixture market in each state or territory by using data from responding SAPAs and the U.S. Department of Transportation Federal Highway apportionment to determine a weighting factor for each state and reconciling the total U.S. asphalt mix tonnage with national estimates.
4. Analyze and summarize the information nationally and by state and prepare a final report.

## Survey Methodology

The survey was conducted using a web survey service, SurveyMonkey®. The survey for 2011 was identical to the survey used for 2009 and 2010 (Hansen & Newcomb, 2011). A copy of the 2011 survey is included in Appendix A. Producers were notified of the survey through several forums and electronic media. A notice was posted in NAPA's e-newsletter, *ActionNews*, informing members of the survey and asking for their participation. SAPAs participated by placing notices on their Web sites and in their newsletters. Announcements were made at NAPA meetings, as well as at several state asphalt conferences. A press release was sent to construction industry trade media and republished to their Web sites. Notices of the survey and links were published through social media channels, including Twitter, Facebook, and LinkedIn. Asphalt mixture producers then went to the Web site and completed the survey form. After the initial data was gathered and analyzed, anomalies in individual producer records were identified and reconciled.

The survey was broken into four sections. These sections were general information, RAP, RAS, and WMA. Table 1 summarizes the questions asked in each section.

**Table 1: Survey Questions Summary**

Section 1: General Information	Sections 2 and 3: RAP & RAS	Section 4: WMA
Number of Plants	Tons Accepted	Average % Produced for DOT Tons
DOT Tons	Tons Used in HMA/WMA	Average % Produced for Other Agency Tons
Other Agency Tons	Tons Used in Aggregate	Average % Produced for Commercial & Residential Tons
Commercial & Residential Tons	Tons Used in Cold Mix	Chemical Additive %
	Tons Used in Other	Additive Foaming %
	Tons Landfilled	Plant Foaming %
	Average % for DOT Mixes	Organic Additive %
	Average % for Other Agency Mixes	
	Average % for Commercial & Residential Mixes	

Most surveys were completed online with one multistate contractor collecting data from its different operations and submitting them in spreadsheet form. Data from the online survey was imported into a spreadsheet and checked for accuracy and missing data. When anomalies in the data were noted, the person submitting the data was contacted to resolve the anomaly.

To determine the total amount of RAP, and RAS used and WMA produced in each state and in the nation, the total amount of asphalt mix produced in each state needed to be determined. Total tonnage of asphalt mix produced represents commercial (i.e., private) and government (i.e., DOTs and local agencies) tonnages. Estimated tonnages were provided by SAPAs in 33 states/territories which totaled about 285 million tons. This included three SAPAs that supplied DOT-estimated tonnages. For these three states, the total tonnage was estimated by dividing the DOT tonnage by the percent of DOT tons provided by asphalt mix producers in that state who completed the survey. To estimate the total tons in states where a SAPA estimate of total tonnage was not available, the total asphalt mixture tonnage was estimated through a relationship developed for those states where SAPA estimated tons were available and their federal highway apportionment. This is the same methodology used to estimate tonnage in the 2009–2010 survey; for more details see Hansen & Newcomb, 2011. This resulted in the following power curve relationship:

$$\text{Total Estimated Tons} = 0.1484 \times (\text{State Federal Apportionment})^{0.8769}$$

This formula was then used to estimate the tonnage for states with no SAPA estimate based on the state's federal apportionment.

## Survey Results

Asphalt mix producers from 49 states and Puerto Rico completed the survey. There is no 2011 survey information available for the District of Columbia or Delaware. In 2009–2010, 48 jurisdictions completed the survey. A total of 203 companies/branches with 1,091 plants are represented in the 2011 survey. In the 2009–2010 survey, 1,027 plants were represented. Table 2 summarizes the number of companies/branches and the number of plants reporting for each state.

**Table 2: No. of Companies/Branches Completing Survey in State**

State	2009–2010		2011		State	2009–2010		2011	
	Companies	Plants	Companies	Plants		Companies	Plants	Companies	Plants
Alabama	3	17	5	38	Montana	2	4	4	8
Alaska	3	20	2	2	Nebraska	—	—	1	3
Arizona	2	4	4	6	Nevada	2	3	2	3
Arkansas	3	9	2	9	New Hampshire	1	11	1	11
California	6	49	4	48	New Jersey	2	21	3	21
Colorado	8	26	7	24	New Mexico	—	—	1	3
Connecticut	2	18	3	23	New York	13	68	11	64
Delaware	1	3	—	—	North Carolina	6	52	5	29
Dist. of Columbia	—	—	—	—	North Dakota	—	—	3	8
Florida	6	61	4	22	Ohio	5	50	5	87
Georgia	2	16	6	66	Oklahoma	4	20	3	18
Hawaii	1	4	1	7	Oregon	6	10	6	16
Idaho	5	17	3	8	Pennsylvania	17	63	7	34
Illinois	16	44	7	24	Puerto Rico	1	16	1	14
Indiana	3	19	4	29	Rhode Island	2	2	2	2
Iowa	7	16	6	14	South Carolina	4	16	3	6
Kansas	6	25	4	21	South Dakota	1	3	3	9
Kentucky	3	24	4	19	Tennessee	2	10	7	72
Louisiana	2	5	2	5	Texas	7	38	9	41
Maine	2	19	2	17	Utah	5	30	6	17
Maryland	4	10	4	10	Vermont	1	9	1	7
Massachusetts	2	8	2	6	Virginia	5	38	7	26
Michigan	4	40	6	39	Washington	6	39	4	30
Minnesota	2	4	6	26	West Virginia	1	14	3	15
Mississippi	1	12	4	26	Wisconsin	1	3	3	13
Missouri	6	35	7	38	Wyoming	2	2	3	7

The average tons produced per plant was 121,000, 117,000, and 121,000 for 2009, 2010, and 2011, respectively.

Table 3 includes the estimated tonnage for each state as given by the SAPA or estimated from the federal apportionment and includes the reported tonnage for each state from the survey results. Figures 1–3 illustrate the Table 3 data and provide another perspective on the survey responses that represent the ratio of the tons reported in each state to the total estimated tons for each year, 2009–2011. The closer a state’s number is to 100 indicates that the reported tonnage from the survey matches the estimated tonnage provided by the SAPA or estimated from the federal apportionment. The returned survey results represent about 36 percent of the estimated total U.S. tonnage for 2011.



**Table 3: Summary of Estimated and Reported Plant Mix Asphalt Tons by State**

State	Tons (Millions)					
	2009		2010		2011	
	Estimated	Reported	Estimated	Reported	Estimated	Reported
Alabama	7.50	1.75	8.00	1.09	8.00	4.24
Alaska	3.67	0.82	4.41	1.15	5.98	0.20
Arizona	7.50	0.42	7.14	0.71	8.00	0.91
Arkansas	3.05	0.71	4.15	0.78	5.56	0.53
California	19.97	8.44	13.79	7.68	23.00	9.38
Colorado	7.72	3.00	10.52	2.62	6.50	2.50
Connecticut	4.96	2.20	5.01	1.79	4.34	2.95
Delaware	0.79	0.35	0.65	0.25	2.08	—
District of Columbia	1.62	—	1.81	—	1.71	—
Florida	14.70	6.91	13.00	5.81	13.57	3.01
Georgia	13.00	1.39	11.70	1.34	9.50	7.29
Hawaii	1.73	0.40	1.91	0.33	1.81	0.54
Idaho	3.00	1.13	3.09	1.14	3.45	0.56
Illinois	19.25	7.81	17.60	7.17	13.94	2.12
Indiana	9.60	3.28	7.90	3.06	9.50	4.07
Iowa	4.74	3.54	3.45	1.99	3.30	1.31
Kansas	4.17	2.08	7.12	1.85	4.00	1.67
Kentucky	7.00	1.72	7.00	1.74	7.00	1.86
Louisiana	6.00	1.30	6.00	1.30	6.00	0.58
Maine	1.80	1.61	2.03	1.60	1.91	1.56
Maryland	7.20	1.07	6.50	1.06	6.50	1.73
Massachusetts	6.00	1.54	6.00	1.34	6.00	1.17
Michigan	11.50	7.49	10.80	7.03	10.00	6.54
Minnesota	12.50	0.42	13.10	0.29	13.00	4.94
Mississippi	4.62	1.45	4.79	1.41	6.00	2.67
Missouri	7.13	3.02	4.70	3.19	8.00	4.06
Montana	3.78	0.19	3.99	0.17	4.89	0.59
Nebraska	2.96	—	3.09	—	3.37	0.11
Nevada	3.11	0.43	3.57	0.43	4.24	0.43
New Hampshire	1.86	1.25	1.94	1.18	1.92	0.90
New Jersey	9.33	3.28	9.09	2.87	8.73	3.24
New Mexico	3.78	—	3.84	—	4.48	0.52
New York	16.00	5.65	16.00	5.54	16.50	5.88
North Carolina	9.37	4.95	12.11	5.66	11.00	2.90
North Dakota	2.55	—	2.70	—	3.89	1.05
Ohio	14.50	5.69	15.10	6.23	14.30	10.81
Oklahoma	5.74	2.47	5.99	2.16	5.20	1.91
Oregon	5.22	1.27	4.81	1.16	4.91	1.95
Pennsylvania	17.40	10.97	18.30	11.66	16.83	4.17
Puerto Rico	2.49	0.97	1.44	0.75	1.19	0.74
Rhode Island	2.07	0.22	2.34	0.19	1.73	0.21
South Carolina	6.23	1.77	6.14	1.98	6.00	0.85
South Dakota	2.73	0.16	2.96	0.22	2.17	0.93
Tennessee	7.95	1.07	7.87	0.73	9.04	7.05
Texas	14.77	4.23	16.54	5.73	13.67	6.36
Utah	3.14	3.71	3.35	3.23	4.00	2.77
Vermont	1.74	0.51	2.12	0.80	1.96	0.71
Virginia	9.10	4.64	10.90	4.51	13.10	4.06
Washington	5.70	4.65	5.70	4.46	4.20	3.26
West Virginia	2.90	1.40	3.00	1.79	3.75	2.10
Wisconsin	10.52	0.50	11.96	0.50	13.00	1.53
Wyoming	2.77	0.15	2.83	0.20	3.25	0.32
Total	358.43	123.98	359.85	119.87	365.97	130.54

Note: Shaded cells indicate states and years where the SAPA provided data used to compute total estimated value. Where no data was available on total tons, a relationship between tonnage and federal apportionment was used to estimate the total tons for states.



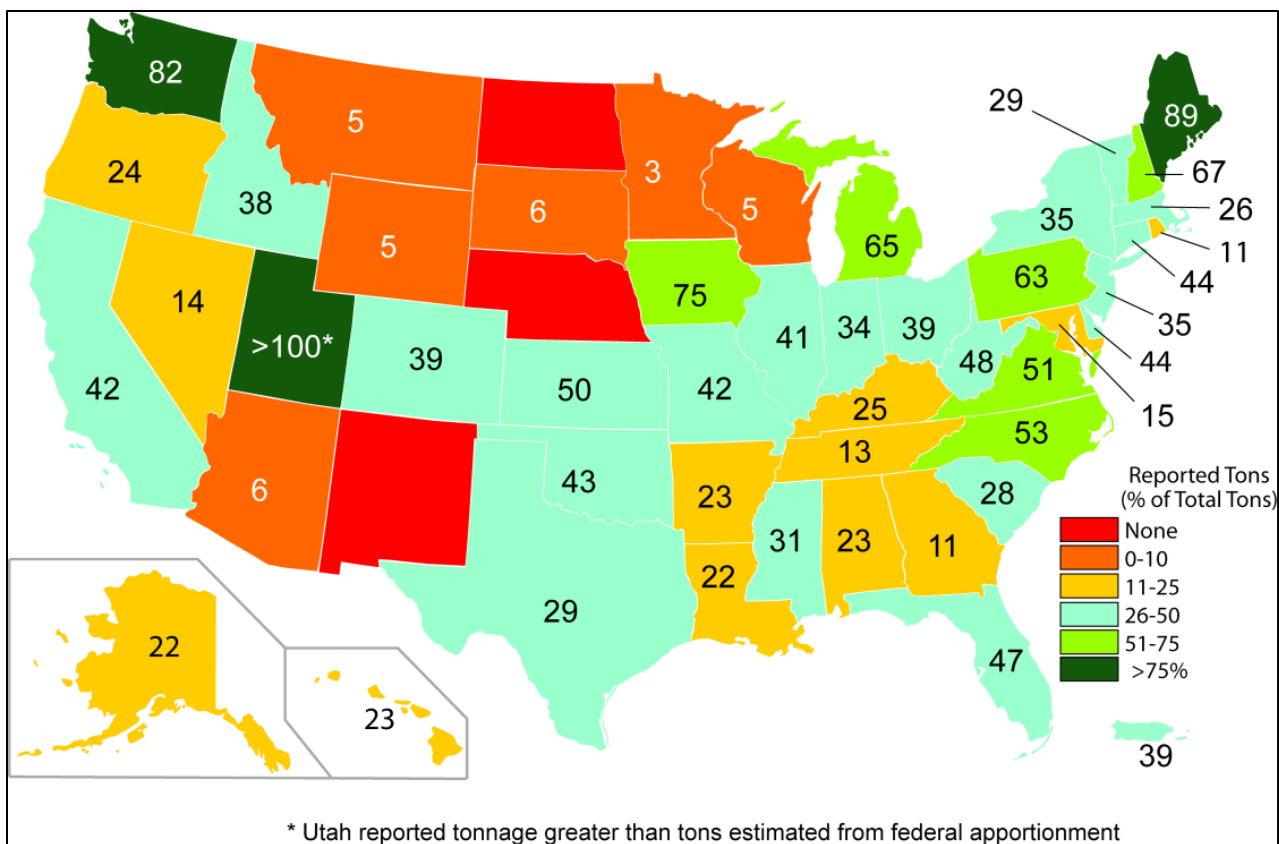


Figure 1: 2009 Reported Tons as a Percent of Estimated Total Tons

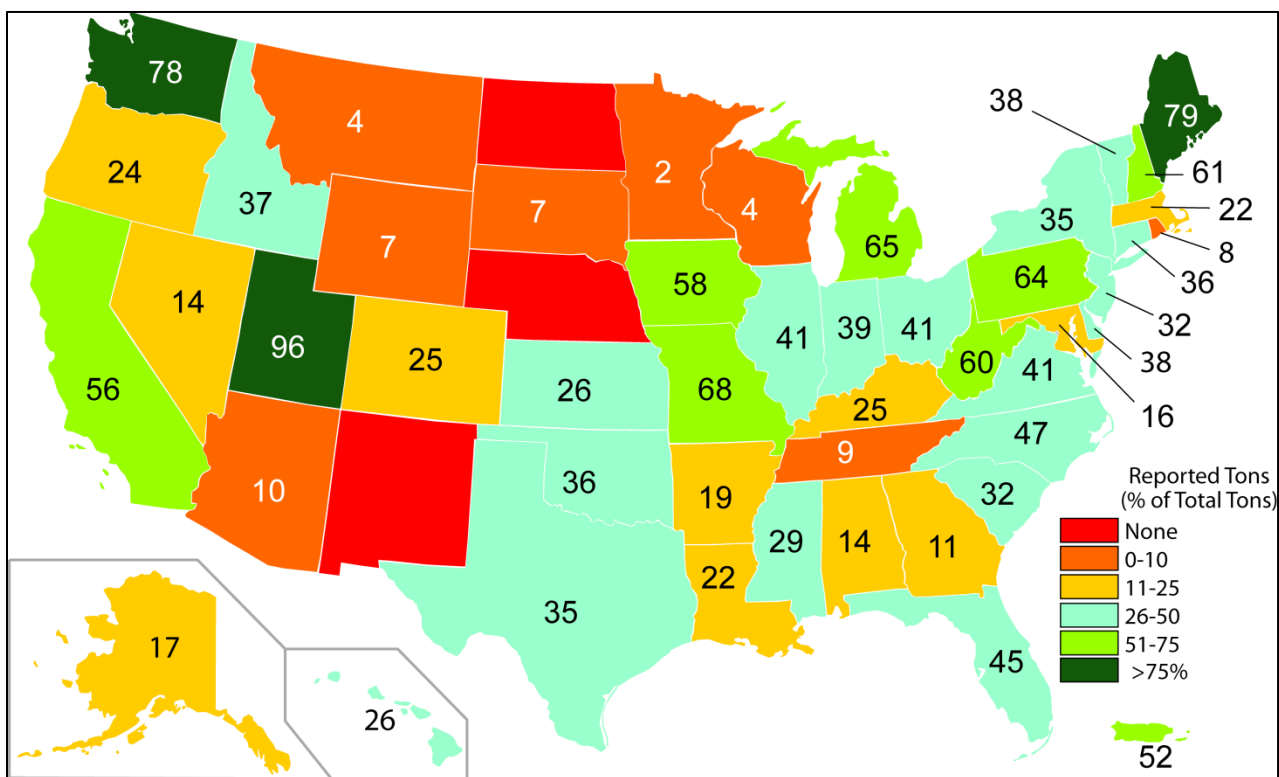


Figure 2: 2010 Reported Tons as a Percent of Estimated Total Tons

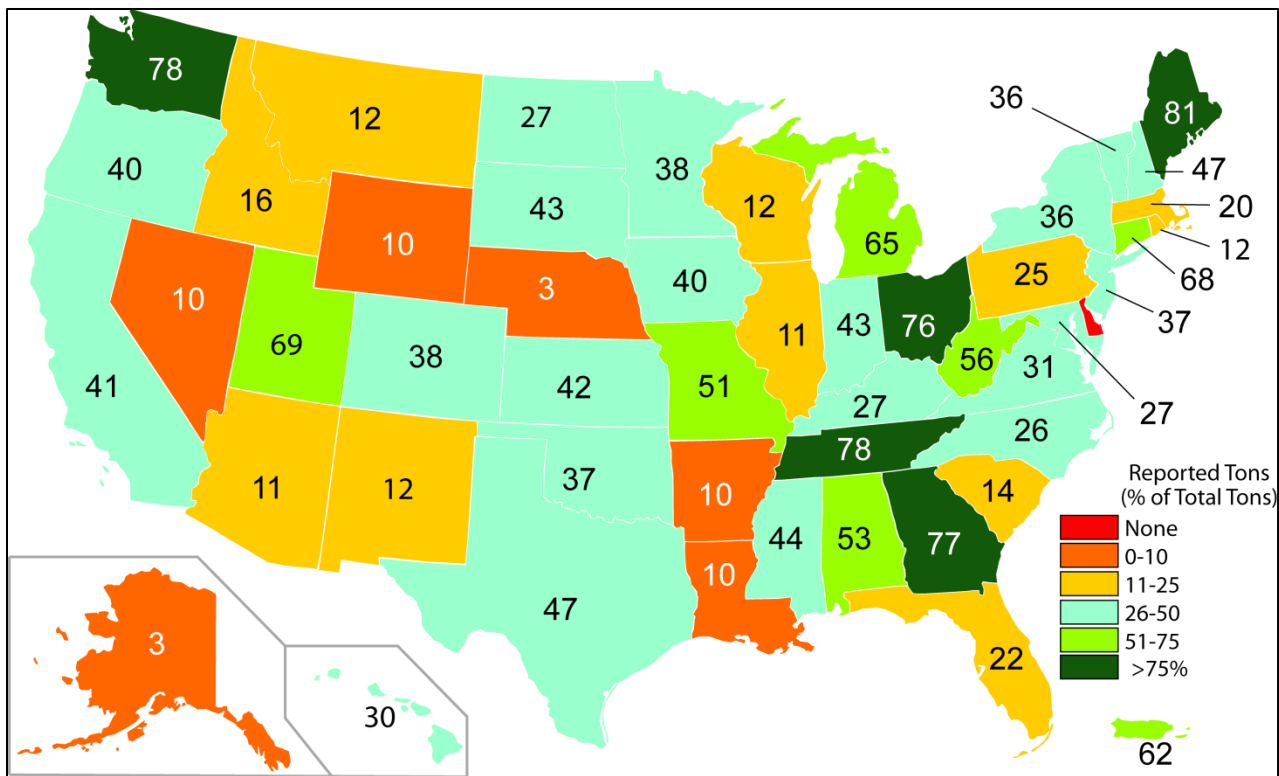


Figure 3: 2011 Reported Tons as a Percent of Estimated Total Tons

Figure 4 shows the number of plants as well as the average tons produced per plant separated by different user/producer group regions. Both the North East Asphalt User/Producer Group (NEAUPG) and the North Central Asphalt User/Producer Group (NCAUPG) have seen a decrease in tons per plant each year since 2009. The Rocky Mountain Asphalt User/Producer Group (RMAUPG), Pacific Coast Conference on Asphalt Specifications (PCCAS), and Southeastern Asphalt User/Producer Group (SEAUPG) have seen an increase in tons per plant from 2010 to 2011.

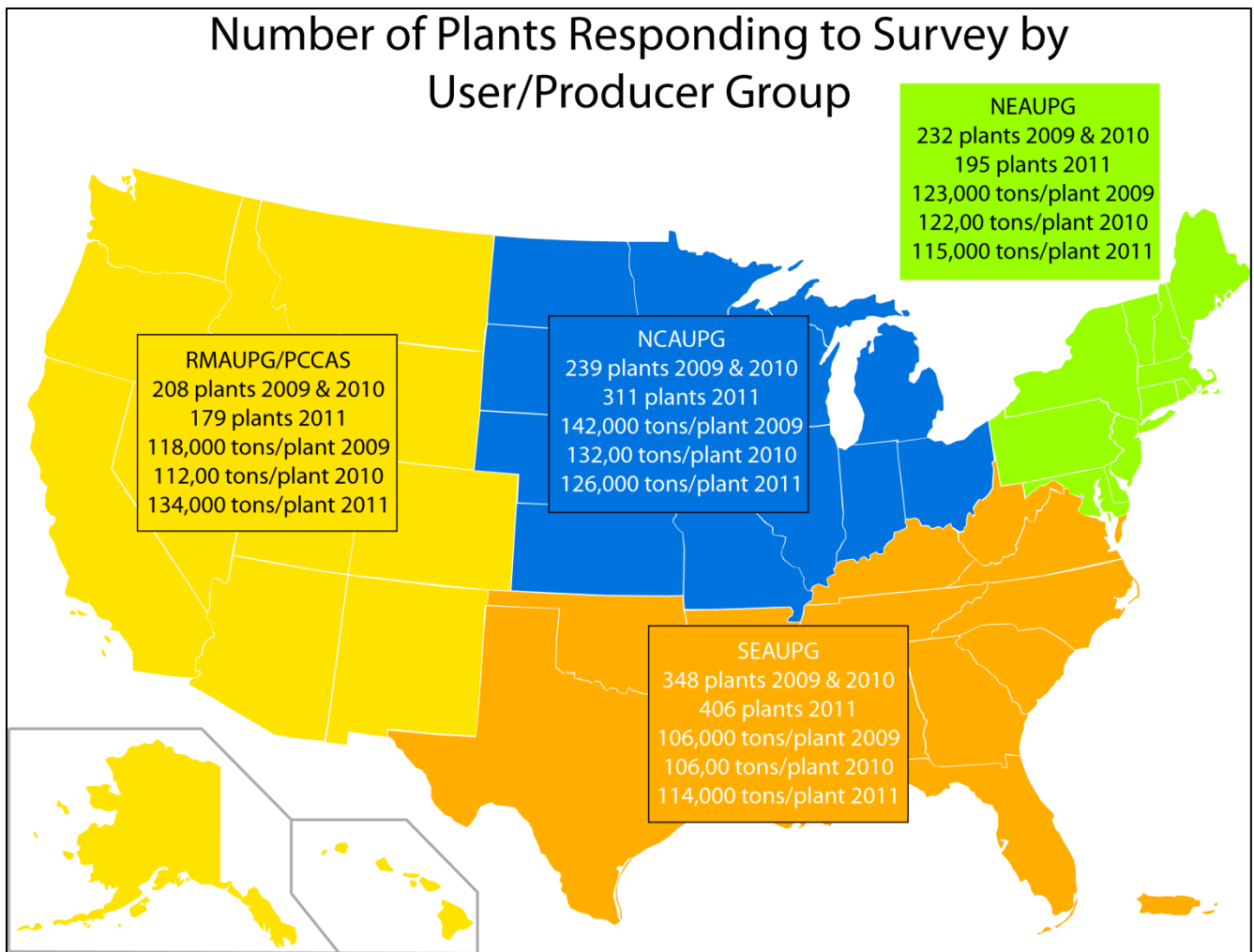


Figure 4: Number of Plants Responding to Survey by User/Producer Group Regions and Estimated Tonnage for Each Year

## Reclaimed Asphalt Pavement

Table 4 summarizes the RAP, RAS, and WMA data from the surveys. The information asked for in the survey is shown in Appendix A and summarized in Table 1. Producers were not asked about allowable RAP or binder replacement requirements. Based on the total estimated tons of RAP received for a given survey year and the amount used for all purposes, including landfilling, there was an estimated 2.3 million, 1.7 million, and 6.3 million tons of RAP stockpiled for future use in 2009, 2010, and 2011, respectively, out of a total of 67.2 million, 73.5 million, and 72.8 million tons received, respectively. Figure 5 is a visual representation of the estimated total tons of RAP used in asphalt mixes, aggregate, cold mix, other uses, and landfilled. The overwhelming majority of RAP is used in hot-mix asphalt (HMA) or warm-mix asphalt, which is the most optimal use of RAP. It is estimated that less than 0.1 percent was sent to landfills in 2009 and 2010 and less than 0.4 percent in 2011.

Table 4: Summary of RAP, RAS, WMA Data

		Reported Values			Total Estimated Value		
		2009	2010	2011	2009	2010	2011
<b>Tons of HMA/WMA Produced</b>		Tons (Millions)			Tons (Millions)		
	Total	123.9	119.8	131.7	358.4	359.8	366.0
	DOT	56.9	55.6	63.1	169.2	172.5	175.3
	Other Agency	28.1	27.8	36.4	83.5	86.2	101.1
	Commercial and Residential	35.6	32.6	32.2	105.8	101.2	89.5
<b>RAP</b>		Tons (Millions)			Tons (Millions)		
	Accepted	23.2	24.0	29.8	67.2	73.5	79.1
	Used in HMA/WMA	20.1	21.6	25.1	56.1	62.1	66.7
	Used in Aggregate	1.5	1.6	1.2	6.2	7.3	4.9
	Used in Cold Mix	0.4	0.4	0.1	1.5	1.6	0.2
	Used in Other	0.1	0.07	0.2	0.7	0.8	0.7
	Landfilled	0.06	0.001	0.1	0.1	0.004	0.3
	Average % Used in Mixes						
	Average % for DOT Mixes <sup>1</sup>	12.5%	13.2%	15.8%			
	Average % for Other Agency Mixes <sup>1</sup>	14.0%	15.2%	16.7%			
	Average % for Commercial & Residential <sup>1</sup>	17.5%	18.0%	19.7%			
	National Average All Mixes Based on % Reported for Different Sectors <sup>1</sup>	15.6%	17.2%	18.2%			
	National Average All Mixes Based on RAP Tons Used in HMA/WMA <sup>2</sup>	16.2%	18.0%	19.1%			
	Companies/Branches Reporting Using RAP	189	189	198			
<b>RAS</b>		Tons (Thousands)			Tons (Thousands)		
	Accepted	332	558	769	957	1,851	2,499
	Used in HMA/WMA	245	392	430	701	1,099	1,192
	Used in Aggregate	5	2	14	6	3	74
	Used in Cold Mix	—	—	—	—	—	—
	Used in Other	39	34	—	123	124	—
	Landfilled	—	0.5	0.1	—	6	0.2
	Average % Used in Mixes						
	Average % for DOT Mixes <sup>1</sup>	0.33%	0.78%	0.66%			
	Average % for Other Agency Mixes <sup>1</sup>	0.37%	0.47%	0.93%			
	Average % for Commercial & Residential Mixes <sup>1</sup>	0.63%	0.81%	1.04%			
	National Average All Mixes Based on RAS Tons Used in HMA/WMA <sup>2</sup>	0.27%	0.33%	0.33%			
	Companies/Branches Reporting Using RAS	44	61	81			
<b>WMA</b>		% Total Production			Tons (Millions)		
	DOT	6.3%	15.0%	23.5%	8.6	20.0	34.6
	Other Agency	4.4%	11.7%	18.2%	3.6	9.8	16.3
	Commercial & Residential	4.5%	11.6%	19.9%	4.6	11.3	17.8
	Total				16.8	41.1	68.7
	% of Market						
	Chemical Additive %	15%	6%	3.8%			
	Additive Foaming %	2%	1%	0.2%			
	Plant Foaming %	83%	92%	95.4%			
	Organic Additive %	0.3%	1%	0.3%			
	Companies/Branches Reporting Using WMA	85	121	150			

<sup>1</sup> Average percent based on contractors reported percentage for each sector.<sup>2</sup> Average percent based on total reported tons of RAP used in HMA/WMA divided by reported total tons HMA/WMA produced.

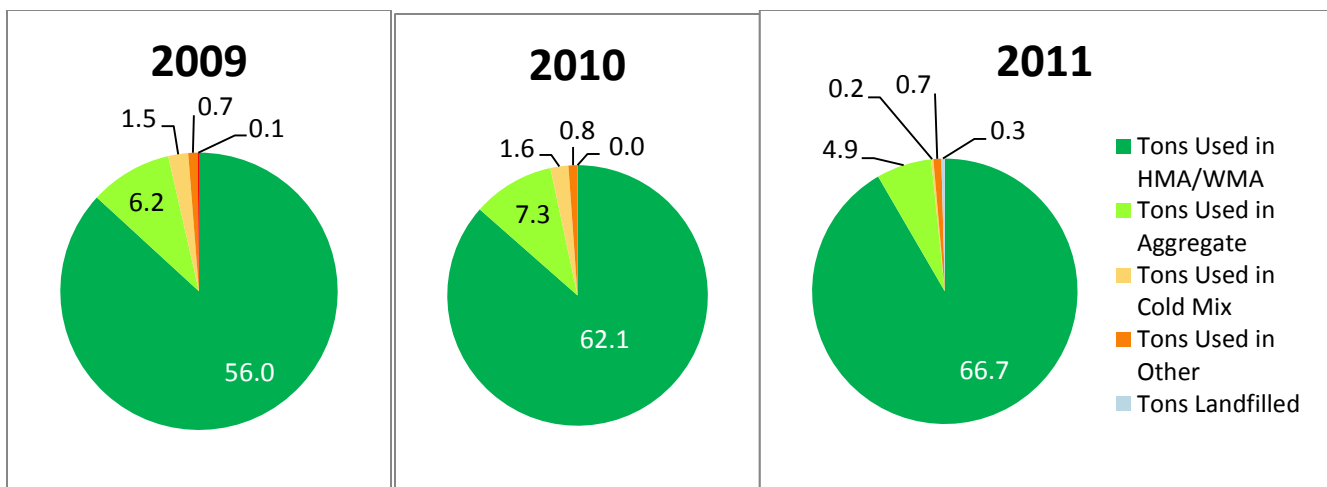


Figure 5: RAP Tons by Final Use (Million Tons)

Figure 6 shows the total estimated amount of RAP used in the different industry sectors. These values were calculated using the average percentages of RAP reported for the different sectors and adjusted to account for the difference between reported RAP tons and tons calculated from the percentage by sector.

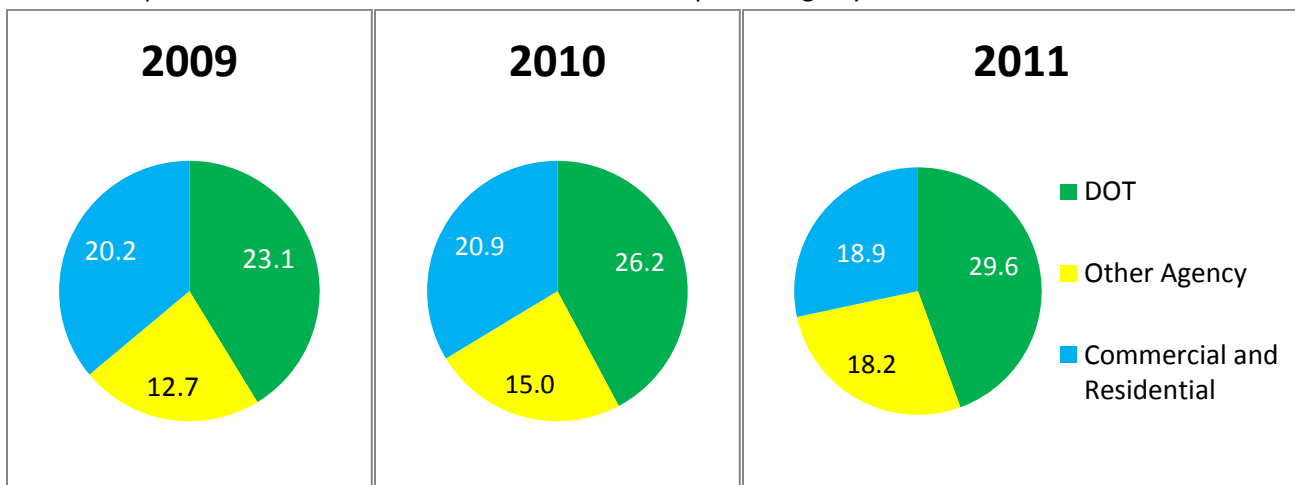


Figure 6: RAP Use by Sector (Million Tons)

Figures 7–9, and Table 5 show the average percent of RAP used in the different states based on reported RAP and total tons. It should be noted that the accuracy of data for individual states will vary depending on the number of responses received from each state and the total number of tons represented by the responses. Comparing Figures 9–11, the number of states averaging more than 15 percent RAP in HMA/WMA (colored green in the charts) increased from 2009 to 2011. The use of increased amounts of RAP has quickly spread in the Midwest and West. As of 2011, Nebraska estimated averaging 30 percent RAP in HMA/WMA.

For 2011, 98 percent of the contractors/branches reported using RAP, and more than 88 percent of these contractors reported excess RAP. From 2010 to 2011, the amount of RAP used in HMA/WMA increased from 62.1 million to 66.7 million tons, for a 7 percent increase. The average percent RAP used in mixes has increased from about 18 percent in 2010 to 19 percent in 2011.

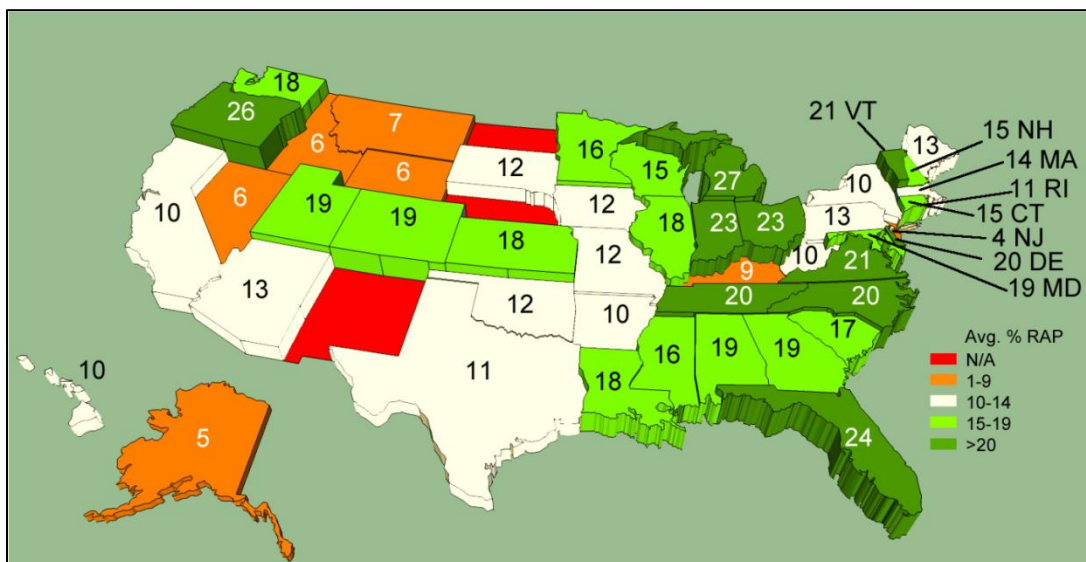


Figure 7: Estimated Average Percent of RAP by State for 2009

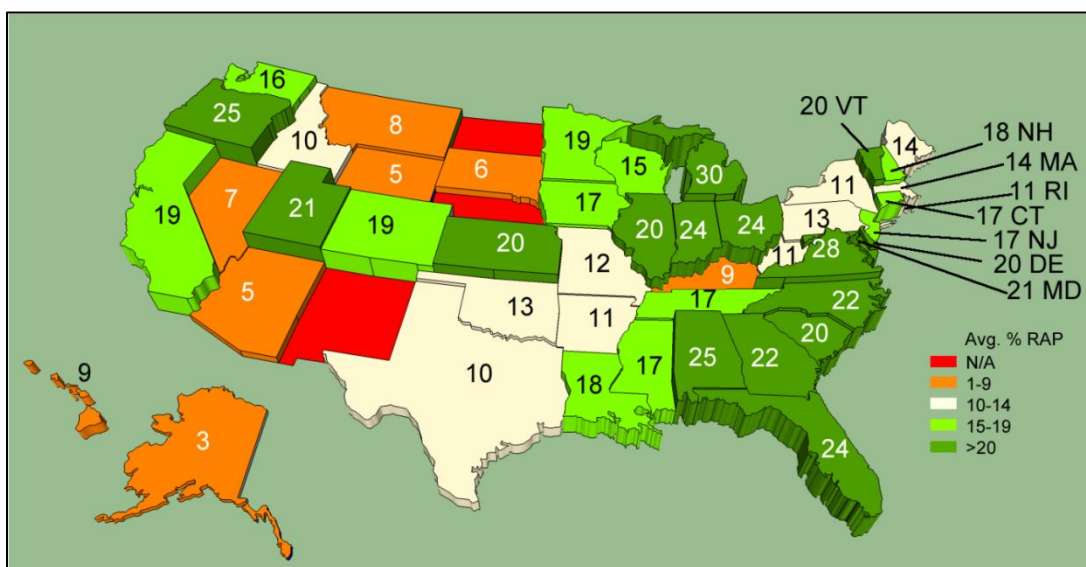


Figure 8: Estimated Average Percent of RAP by State for 2010

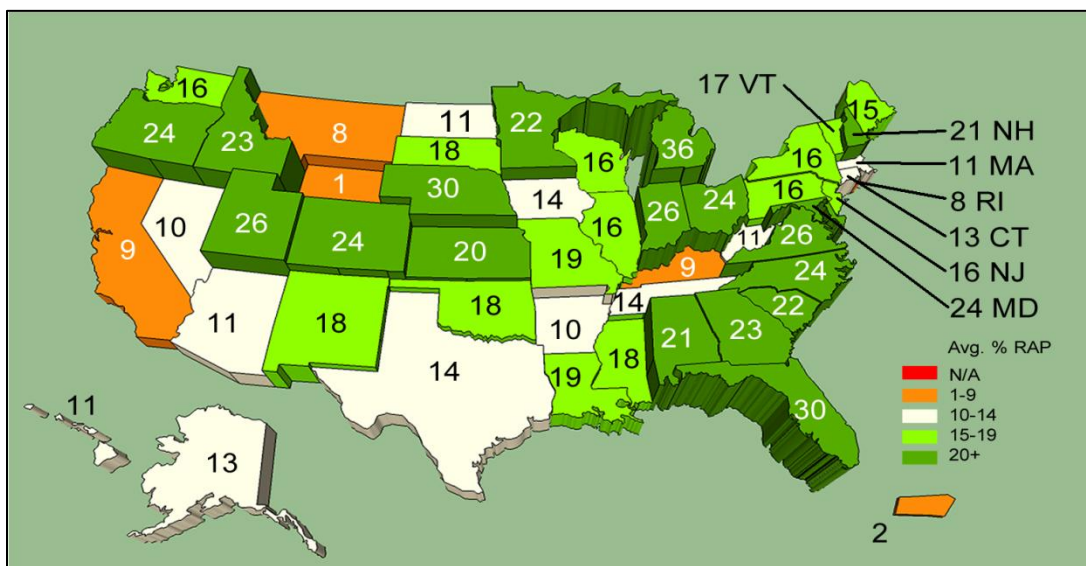


Figure 9: Estimated Average Percent of RAP by State for 2011



Table 5: Estimated Average Percent of RAP by State

State	Average RAP Percent			State	Average RAP Percent		
	2009	2010	2011		2009	2010	2011
Alabama	19	25	21	Montana	7	8	8
Alaska	5	3	13	Nebraska	NR	NR	30
Arizona	13	5	11	Nevada	6	7	10
Arkansas	10	11	10	New Hampshire	15	18	21
California	10	19	9	New Jersey	4	17	16
Colorado	19	19	24	New Mexico	NR	NR	18
Connecticut	15	17	13	New York	10	11	16
Delaware	20	20	NR	North Carolina	20	22	24
Dist. of Columbia	NR	NR	NR	North Dakota	NR	NR	11
Florida	24	24	30	Ohio	23	24	24
Georgia	19	22	23	Oklahoma	12	13	18
Hawaii	10	9	11	Oregon	26	25	24
Idaho	6	10	23	Pennsylvania	13	13	16
Illinois	18	20	16	Puerto Rico	0	0	2
Indiana	23	24	26	Rhode Island	11	11	8
Iowa	12	17	14	South Carolina	17	20	22
Kansas	18	20	20	South Dakota	12	6	18
Kentucky	9	9	9	Tennessee	20	17	14
Louisiana	18	18	19	Texas	11	10	14
Maine	13	14	15	Utah	19	21	26
Maryland	19	21	24	Vermont	21	20	17
Massachusetts	14	14	11	Virginia	21	28	26
Michigan	27	30	36	Washington	18	16	16
Minnesota	16	19	22	West Virginia	10	11	22
Mississippi	16	17	18	Wisconsin	15	15	16
Missouri	12	12	19	Wyoming	6	5	1

NR	= No contractors reporting
	= 1–9 %
	= 10–14%
	=15–19%
	= ≥20%

## Reclaimed Asphalt Shingles

Table 4 includes the summary of RAS data from the surveys. The information asked for in the survey is shown in Appendix A and summarized in Table 1. Producers were not asked about allowable RAS or binder replacement requirements. Based on the total estimated tons received and the amount used for all purposes, including landfilling, about 1.23 million tons of RAS was stockpiled for future use in 2011. The survey for 2009 and 2010 showed a total stockpile amount of 742,000 tons for both years. From 2010 to 2011, the amount of RAS accepted by producers increased by 35 percent. The amount of RAS landfilled decreased from 2010 to 2011 from about 0.3 percent to less than 0.1 percent. In 2011, no RAS was reported as being used for other purposes, while in 2009 and 2010 a small percentage of RAS tons was diverted to other purposes. This change may be accounted for in the increase in the number of RAS tons used in aggregate in 2011.

Figure 10 shows the total estimated amount of RAS used. There was a large increase, 48 percent, in the amount of RAS used between 2009 and 2010 and a more modest increase, 8 percent, from 2010 to 2011. Similar to RAP, RAS is



primarily used in HMA/WMA. Figure 11 summarizes how RAS was used in the different sectors of the paving market. These values were calculated using the average percentages of RAS reported for the different sectors and were adjusted to account for the difference in reported RAS tons and the tons calculated from the percentage by sector. There was a large increase in the use of RAS by public agencies other than DOTs, a decrease in the DOT sector, and a modest increase in the commercial/residential sector. The number of companies/branches using RAS increased from 61 to 81 from 2010 to 2011, a 33 percent increase.

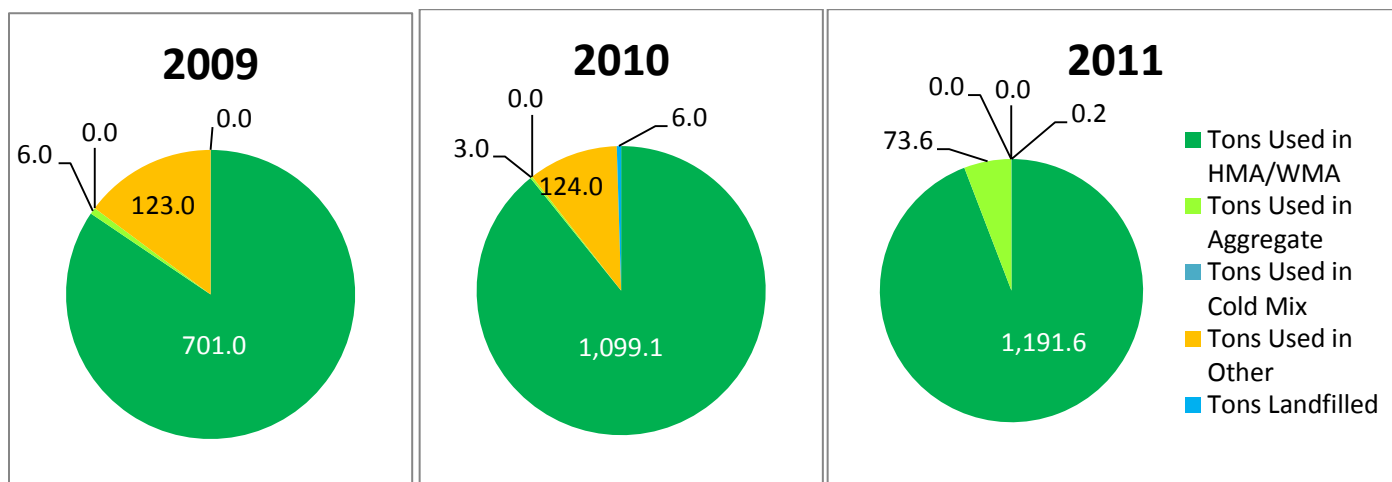


Figure 10: Summary of RAS Use (Thousand Tons)

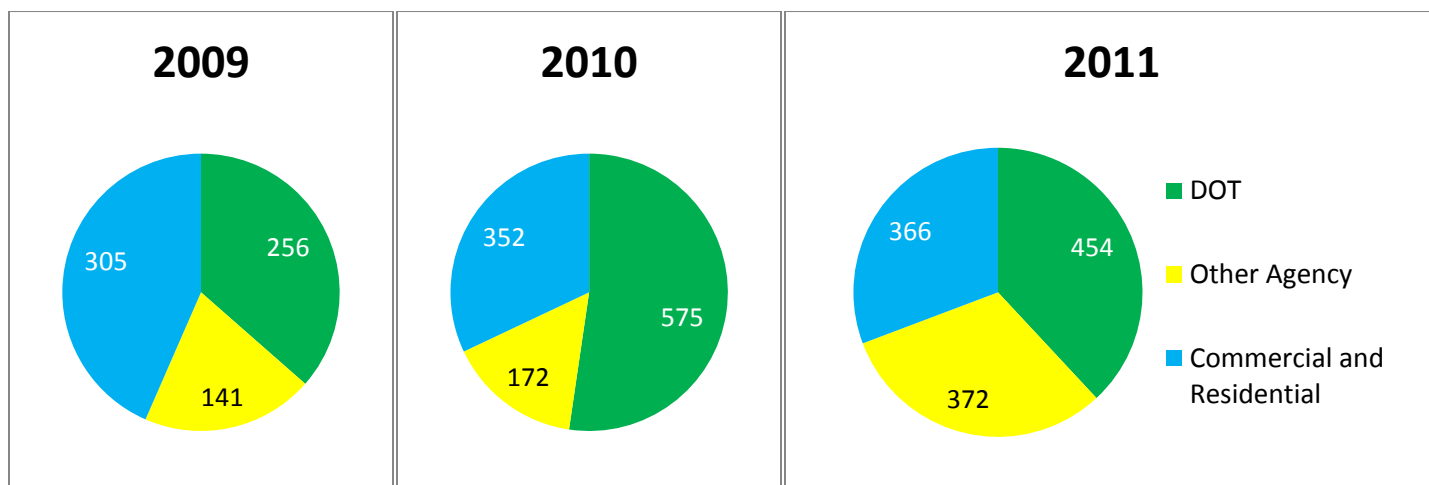


Figure 11: Summary of Estimated RAS Use by Sector (Thousand Tons)

Figure 12 shows states where plant-mix producers reported using RAS in 2009 through 2011. Red indicates states where RAS use was not reported for these years. The number of states where plant-mix producers reported using RAS increased from 26 to 32 from 2010 to 2011. Four states (Nevada, West Virginia, Delaware, and Rhode Island) reported using RAS in previous years, but did not report its use in 2011. (Note: No data was reported for Delaware for 2011.) Table 6 shows the states where producers reported using RAS for 2009–2011.

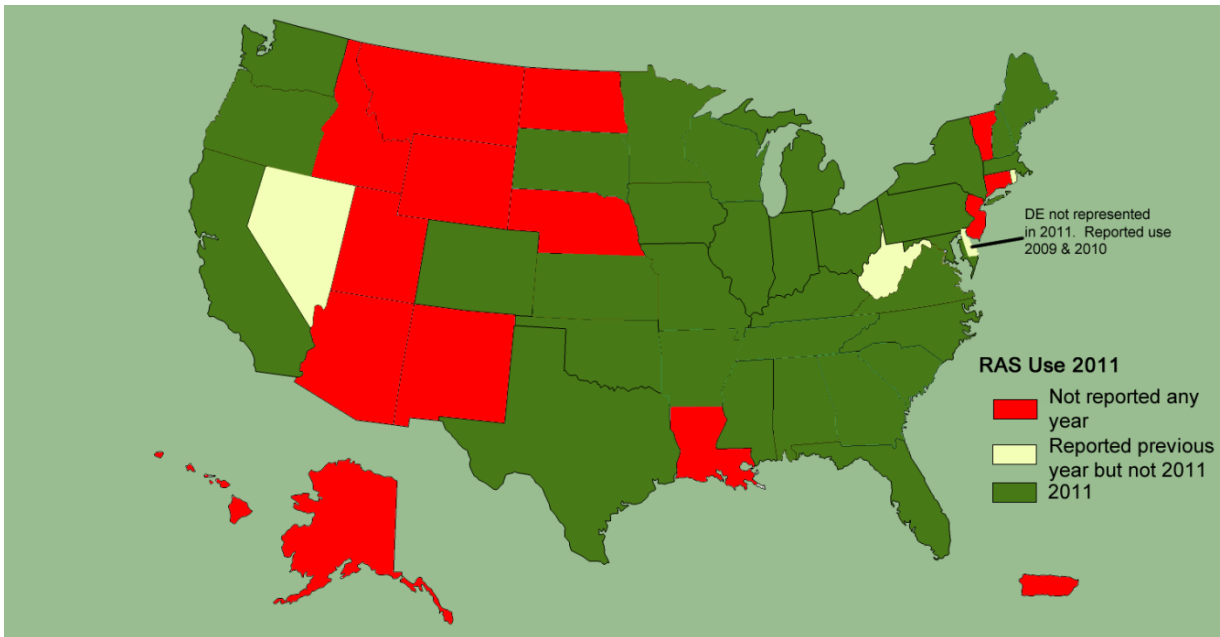


Figure 12: States with Companies/Branches Reporting Using RAS

Table 6: State Reporting RAS Use

State	RAS Used?			State	RAS Used?		
	2009	2010	2011		2009	2010	2011
Alabama	No	Yes	Yes	Montana	No	No	No
Alaska	No	No	No	Nebraska	NR	NR	No
Arizona	No	No	No	Nevada	No	Yes	No
Arkansas	No	No	Yes	New Hampshire	No	No	Yes
California	Yes	Yes	Yes	New Jersey	No	No	No
Colorado	Yes	Yes	Yes	New Mexico	NR	NR	No
Connecticut	No	No	No	New York	Yes	Yes	Yes
Delaware	Yes	Yes	NR	North Carolina	Yes	Yes	Yes
Dist. of Columbia	NR	NR	NR	North Dakota	NR	NR	No
Florida	Yes	Yes	Yes	Ohio	Yes	Yes	Yes
Georgia	No	No	Yes	Oklahoma	Yes	Yes	Yes
Hawaii	No	No	No	Oregon	No	Yes	Yes
Idaho	No	No	No	Pennsylvania	Yes	Yes	Yes
Illinois	Yes	Yes	Yes	Puerto Rico	No	No	No
Indiana	Yes	Yes	Yes	Rhode Island	No	Yes	No
Iowa	Yes	Yes	Yes	South Carolina	No	No	Yes
Kansas	No	Yes	Yes	South Dakota	No	No	Yes
Kentucky	Yes	Yes	Yes	Tennessee	No	No	Yes
Louisiana	No	No	No	Texas	Yes	Yes	Yes
Maine	No	No	Yes	Utah	No	No	No
Maryland	Yes	Yes	Yes	Vermont	No	No	No
Massachusetts	Yes	Yes	Yes	Virginia	Yes	No	Yes
Michigan	Yes	Yes	Yes	Washington	Yes	Yes	Yes
Minnesota	No	Yes	Yes	West Virginia	Yes	No	No
Mississippi	Yes	Yes	Yes	Wisconsin	No	No	Yes
Missouri	Yes	Yes	Yes	Wyoming	No	No	No

NR = No Contractors Reporting

Yes = RAS Use Reported

No = No RAS Use Reported

## Warm-Mix Asphalt

Table 4 includes the summary WMA data from the survey. The survey asked producers their estimated percentages of tons produced for the different sectors and the percent of which technologies were used.

WMA saw another strong increase from 2010 to 2011. Figure 13 shows a steady increase in the number of companies/branches using WMA from 2009 to 2011. Figure 14 shows a steady increase in the number of tons of WMA. This is probably due to increased acceptance of WMA by all industry sectors.

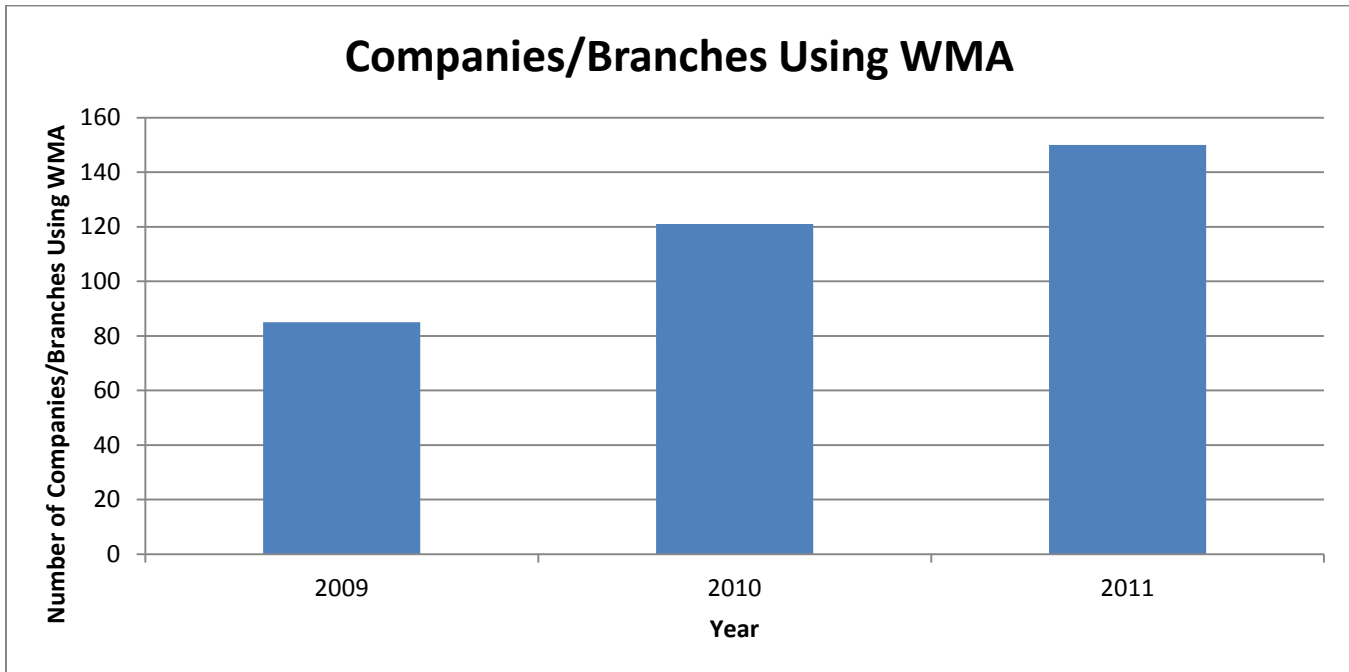


Figure 13: Number of Companies/Branches Using WMA

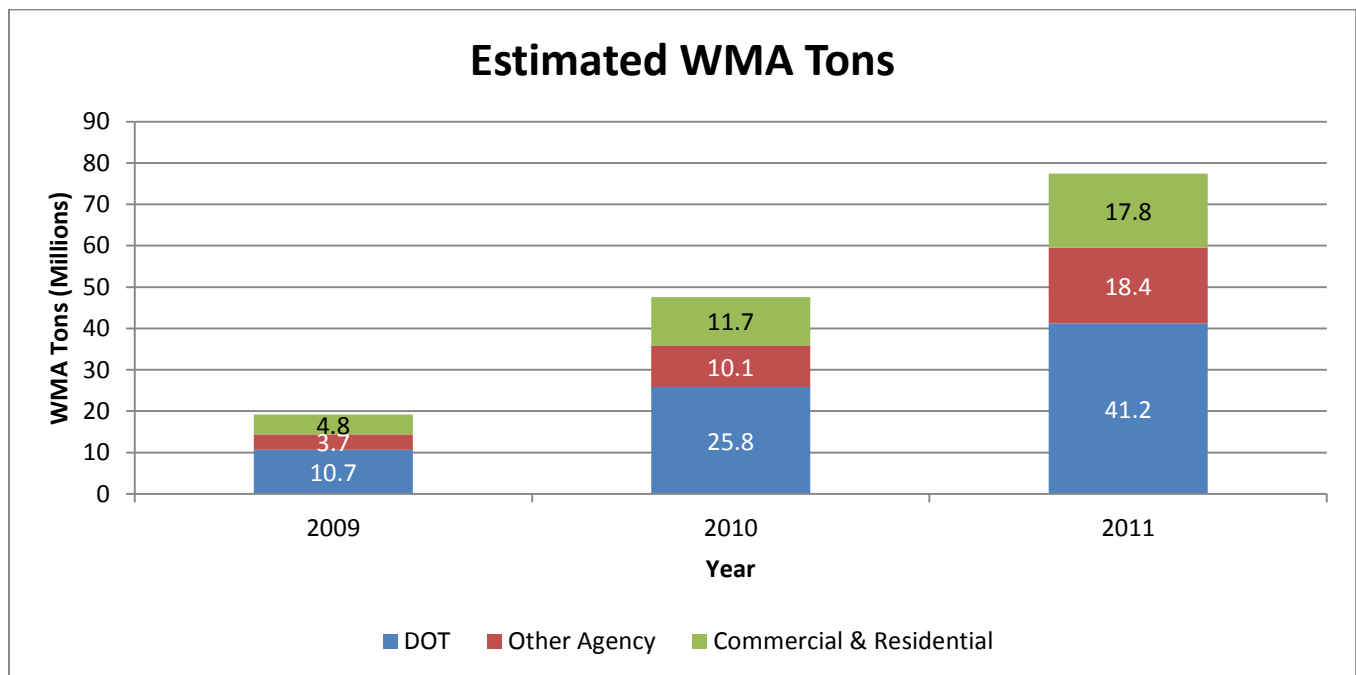


Figure 14: Estimated Tons (in millions) WMA by Industry Sector

Figures 15–18 show the estimated total tons of WMA produced in each state grouped by region. Figure 19 shows WMA production as a percentage of the total asphalt mix production for 2011. It should be noted that the accuracy of data for individual states will vary depending on the number of responses received from each state and the total number of tons represented by the responses.

While most states showed an increase in WMA production from 2010 to 2011, two states — Maryland and Texas — showed a decrease. The reasons for these decreases are uncertain. A contributing factor for the reduced WMA tonnage in Texas is a reported 17-percent decrease in total asphalt mix production from 2010 to 2011 in that state. Maryland, however, had the same estimated total tonnage from 2010 to 2011.

Nationally, the total tons of WMA increased from 41.1 million tons in 2010 to 68.7 million tons in 2011, a 67 percent increase. Plant foaming is used most often in producing WMA. Use of WMA additives is declining, accounting for about 17 percent of the total WMA production in 2009, 8 percent in 2010, and 5 percent in 2011.

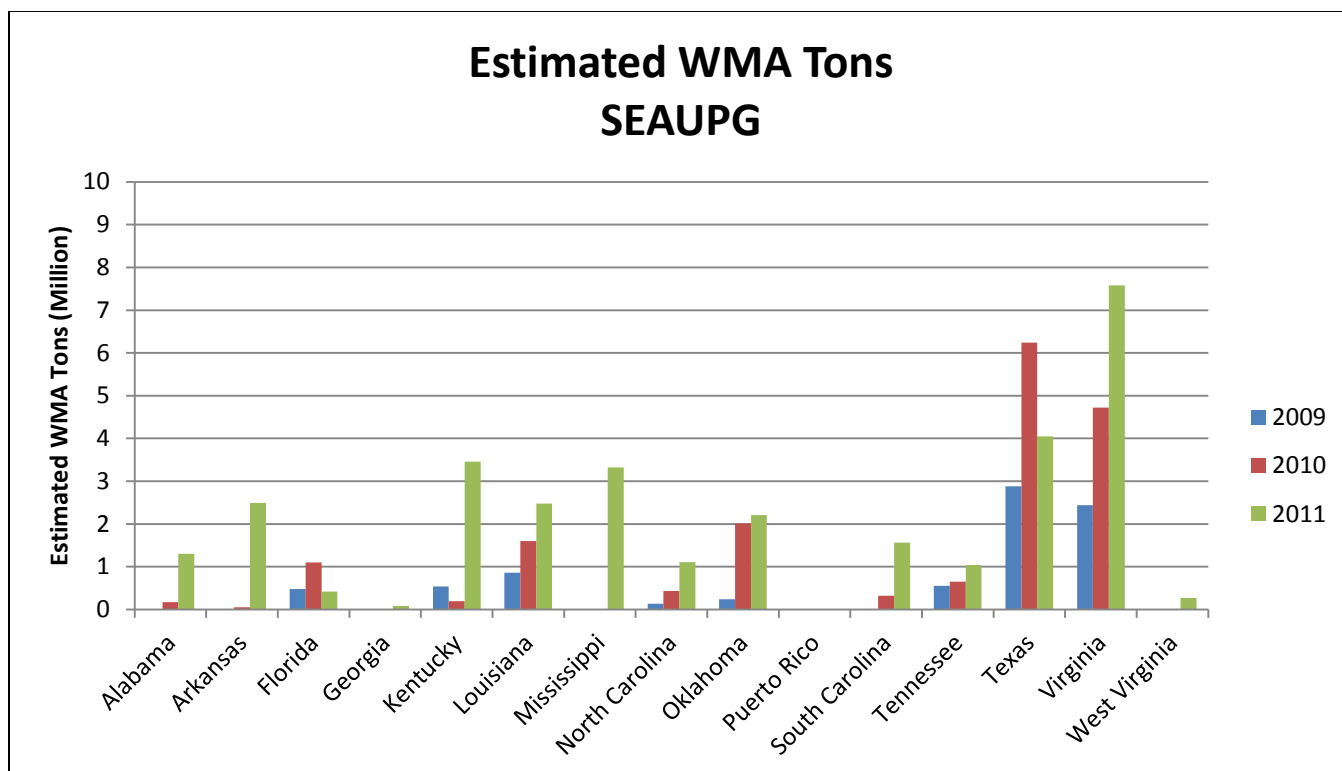


Figure 15: Estimated Total WMA Tons for Southeastern Asphalt User/Producer Group States

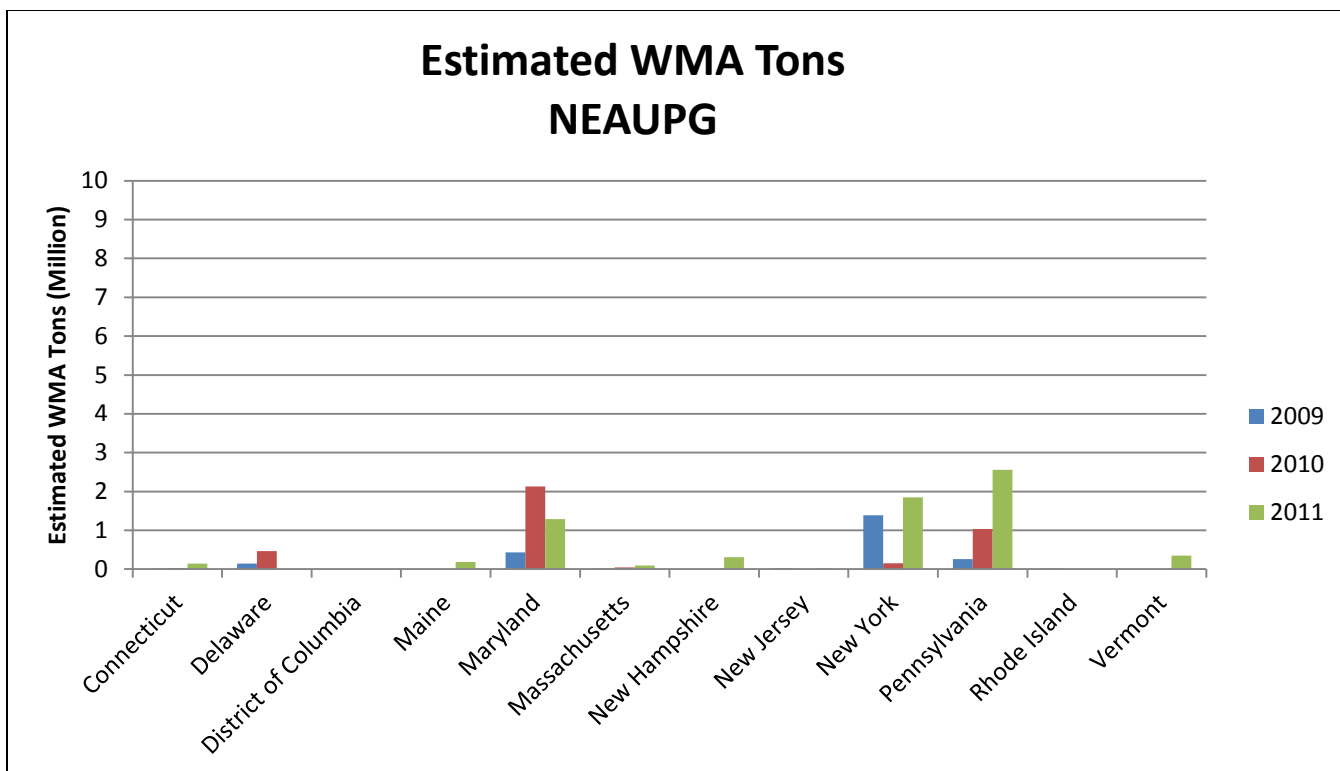


Figure 16: Estimated Total WMA Tons for North East Asphalt User/Producer Group States

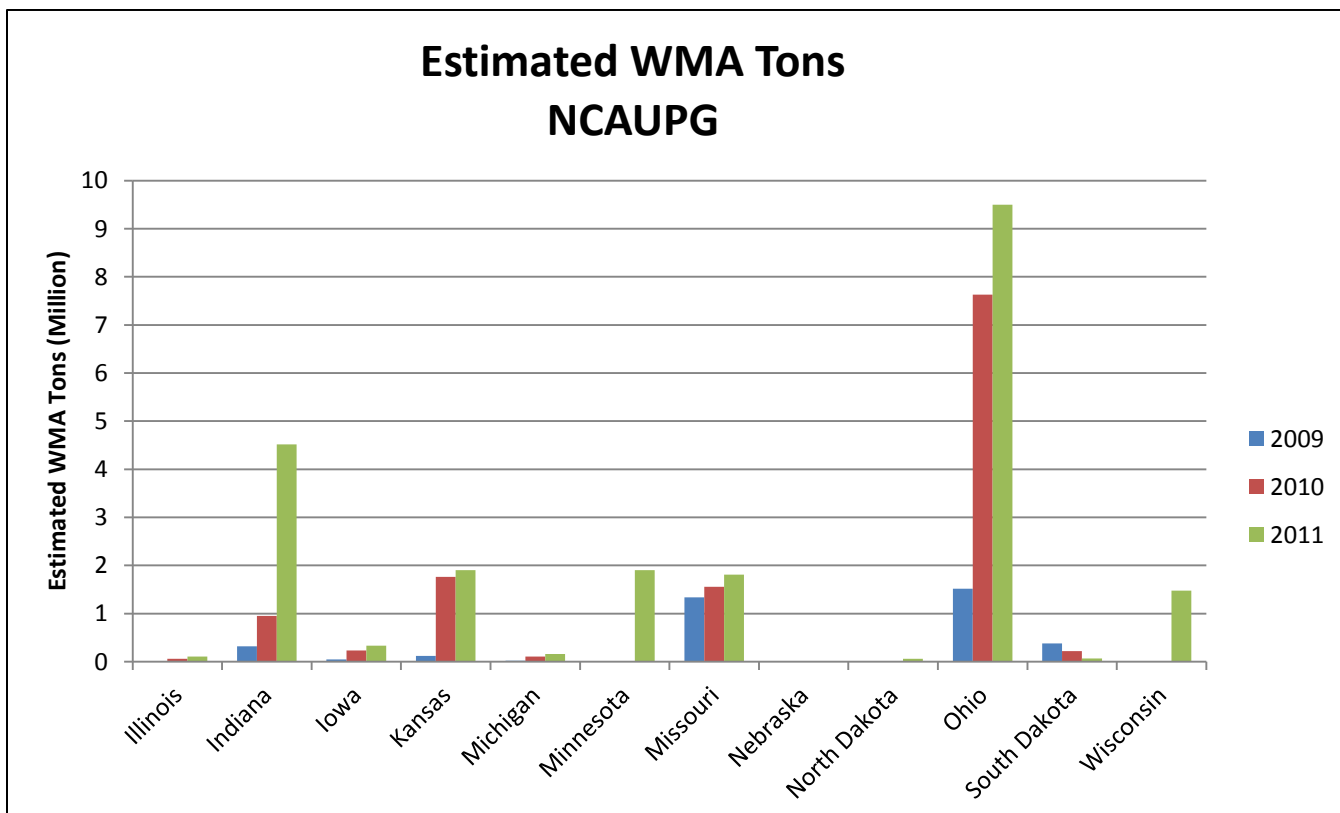


Figure 17: Estimated Total WMA Tons for North Central Asphalt User/Producer Group States

## Estimated WMA Tons RMAUPG & PCCAS

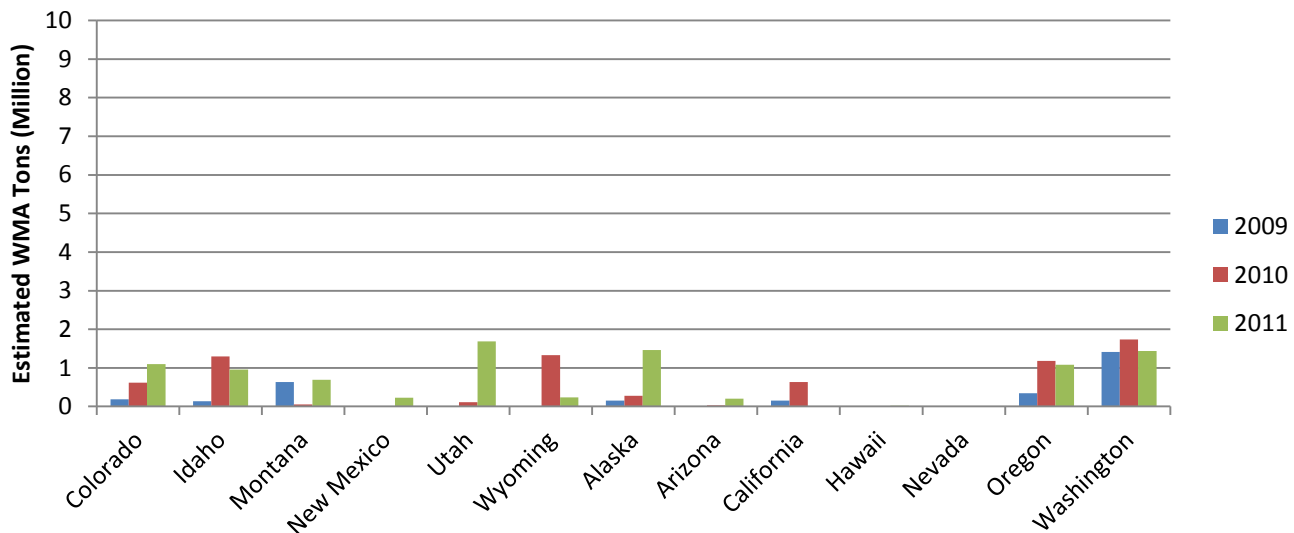


Figure 18: Estimated Total WMA Tons for Rocky Mountain Asphalt User/Producer Group and Pacific Coast Conference on Asphalt Specification States

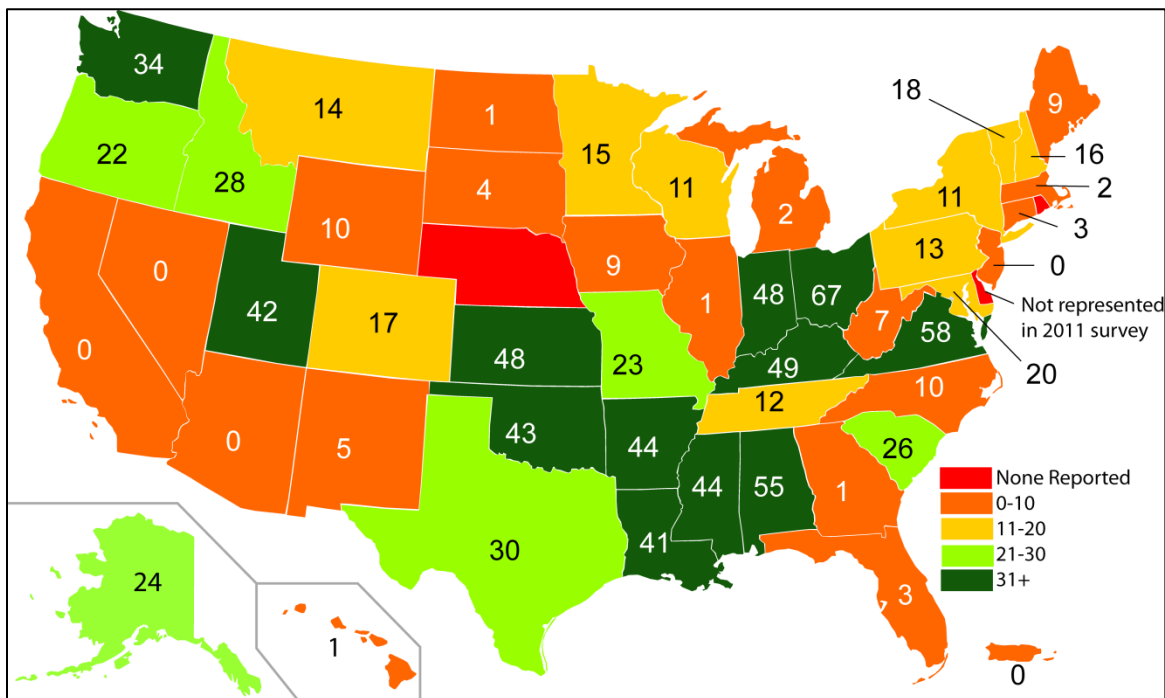


Figure 19: 2011 WMA Production as a Percentage of Total Asphalt Mix Production.

## Summary and Conclusions

The objective of this survey was to quantify the use of RAP, RAS, and WMA produced by the asphalt pavement industry. Asphalt mix producers from 49 states and Puerto Rico completed the 2011 survey. A total of 203 companies/branches with 1,091 plants were represented in the 2011 survey.

The estimated total asphalt mix production saw a slight increase from 360 million to 366 million tons from 2010 to 2011.

The use of recycled material continues to increase. The survey shows:

- The number of contractors using RAP increased from 189 in 2009 and 2010 to 198 in 2011.
- 98 percent of the contractors/branches reported using RAP in 2011, up slightly from 96 percent in 2009 and 2010.
- The estimated amount of RAP used in asphalt mixtures has increased steadily from 2009 to 2011. The estimated tons of RAP used in asphalt mixes for 2009, 2010, and 2011 are 56.1 million, 62.1 million, and 66.7 million tons, respectively. This represents about a nearly 19 percent increase in the amount of tons used between 2009 and 2011 and a more than 7 percent increase in the amount of tons used between 2010 and 2011.
- The estimated average percent of RAP used has increased from 16.2 percent to 18.0 percent to 19.1 percent for 2009, 2010, and 2011 respectively.
- 88 percent of the contractors/branches reported having excess RAP in 2011. The estimated excess tons of RAP accepted in 2011 was 6.3 million tons.
- Use of RAS (both manufacturers' scrap and post-consumer shingles) increased from 1.1 million tons used in 2010 to 1.2 million tons used in 2011, an 8 percent increase.
- The amount of RAS acceptance by asphalt mix producers increased by 35 percent from 2010 to 2011, and 74 percent of the contractors/branches reported having excess RAS for 2011. The estimated excess tons of RAS accepted in 2011 was 1.3 million tons.
- Of the RAS used in 2011, 94 percent was used in asphalt mixes. The remainder was primarily combined with aggregates. Less than 0.2 percent was landfilled.
- The number of states with reported RAS use increased from 26 to 32 in 2011.

The use of WMA continues to increase steadily. The survey shows:

- The estimated total production of WMA for 2011 was 68.7 million tons. This was a 67 percent increase over 2010 WMA (41.1 million tons) and over 300 percent increase over 2009.
- WMA was about 19 percent of the total asphalt mixture market in 2011.
- Plant foaming, representing more than 95 percent of the market, is the most commonly used technology; additives accounted for less than 5 percent of the market.

The 2011 survey results show that the asphalt pavement industry continues to improve its outstanding record of sustainable practices by further increasing the use of recycled materials and WMA. RAP use continues to increase steadily, but there still is an excess in the amount of RAP produced versus RAP used each year. This indicates that opportunities exist to increase the amount of RAP used in asphalt mixes through permissive specifications and through improved RAP processing, production equipment and procedures, and education.

RAS use saw a smaller increase in 2011 to about 1.2 million tons used in asphalt mixes. This represents nearly 11 percent of the estimated 11 million ton waste shingle market (manufacturer and post-consumer waste). This indicates that there are still opportunities for increasing the use of RAS in asphalt mixtures, especially in the 16 states and territories where no RAS use was reported for 2009–2011. As with RAP, permissive specifications, improved processing, production equipment and procedures, and education will help.

WMA again saw an increase of more than 67 percent from 2010 to 2011. All reporting states, with the exception of Nebraska and Rhode Island, reported using WMA in 2011. WMA production now represents about 19 percent of the total estimated asphalt mix production in the United States, and it is expected to grow as contractors and agencies gain experience and more states implement permissive specifications.



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**2<sup>nd</sup> Annual Asphalt Pavement Industry Survey  
IS-138**



2<sup>nd</sup> Annual Asphalt Pavement  
Industry Survey on  
Reclaimed Asphalt Pavement,  
Reclaimed Asphalt Shingles,  
and Warm-mix Asphalt Usage:  
2009-2011

Appendix A: Survey Forms

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# RAP, RAS, WMA Survey 2011

## Purpose

The National Asphalt Pavement Association is working with the Federal Highway Administration to determine the amount of Hot-Mix Asphalt (HMA), Warm-Mix Asphalt (WMA), Reclaimed Asphalt Pavement (RAP) and Reclaimed Asphalt Shingles (RAS) being produced and used in each state. The following survey will be used to collect this data.

It is important to the industry that you complete this survey so we have accurate information regarding the use of RAP, RAS and Warm-Mix-Asphalt in order to identify areas needing assistance in implementation.

DATA FROM THIS SURVEY WILL BE CONFIDENTIAL AND WILL BE USED ONLY FOR THE PURPOSES OF DETERMINING THESE QUANTITIES AND WILL NOT BE USED FOR ANY OTHER PURPOSE. DATA WILL BE REPORTED BY STATE ONLY. NO COMPANY SPECIFIC INFORMATION WILL BE DISCLOSED OR USED FOR ANY OTHER PURPOSE.

This information will be shared with industry and agencies to help in the implementation of recycling and warm mix technologies.

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

# RAP, RAS, WMA Survey 2011

## Contact Information

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

Contact Kent Hansen, [khansen@asphaltpavement.org](mailto:khansen@asphaltpavement.org) or Audrey Copeland, [acopeland@asphaltpavement.org](mailto:acopeland@asphaltpavement.org) at NAPA if you have any questions. 888-468-6499

### \*1. Company/Branch Name:

### \*2. Contact Person's Name & Address

### \*3. Contact Person's email

### \*4. Contact Person's Phone Number

# RAP, RAS, WMA Survey 2011

## State

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

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

### \*5. Which state is the information provided for?

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

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

Number of plants

## Total Asphalt Tonnage for 2011

Please complete the following information for the total tonnage of all asphalt production in 2011.

**\*7. What was your total tonnage of asphalt mixes in 2011 for the following categories?  
(Use best estimate if data is not available)**

State DOT

Other Agencies (city, county, FAA, military)

Commercial & residential



## RAP Supply and Use 2011

Please complete the following information on the amount of RAP received and used for 2011.

**\*8. Did you accept, process or use RAP in this state in 2011?**

☐ Yes

☐ No

# RAP, RAS, WMA Survey 2011

## RAP Supply and Use 2011

Please complete the following information on the amount of RAP received and used for 2011.

**\*9. How many tons of removed asphalt pavement and asphalt millings were accepted/delivered to your facilities in the state in 2011?**

Tons:

**\*10. How many tons of RAP were used in 2011 for the following purposes? (Use best estimate if data not available)**

Recycled back into HMA/WMA mixes:

Aggregate base:

Cold mix:

Other:

Landfilled:

**\*11. What was the average RAP percentage used in asphalt mixes in 2011 for the following categories? (Use best estimate if data not available)**

State DOT

Other Agencies (city, county, FAA, military)

Commercial & residential

**\*12. At the end of the year 2011 did you have excess RAP (processed or unprocessed) in inventory?**

☐ Yes

☐ No

## Reclaimed Asphalt Shingles (RAS) Supply and Use for 2011

Please complete the following information on the amount of waste shingles received (processed and unprocessed) and used for 2011.

**\*13. Did you accept waste shingles and/or process or use Reclaimed Asphalt Shingles (RAS) in 2011?**

☐ Yes

☐ No

## Reclaimed Asphalt Shingles (RAS) Supply and Use for 2011

Please complete the following information on the amount of waste shingles received (processed and unprocessed) and used for 2011.

**\*14. How many tons of unprocessed shingles (manufacturers waste and tear-offs) were accepted/delivered to your facilities in the state in 2011?**

Tons:

**\*15. How many tons of reclaimed asphalt shingles (RAS) were used for the following purposes in 2011? (Use best estimate if data not available)**

Recycled into HMA/WMA mixes:

Aggregate base:

Cold mix:

Other:

Landfilled:

**\*16. What was average RAS percentage used in asphalt mixes in 2011 for the following categories? (Use best estimate if data is not available)**

State DOT

Other Agencies (city, county, FAA, military)

Commercial & residential

**\*17. At the end of the year 2011 did you have excess RAS? (include processed and unprocessed shingles)**

☐ Yes

☐ No

## Warm Mix Asphalt Production for 2011

Warm-mix asphalt is the generic term for a variety of technologies that allow the producers of hot-mix asphalt pavement material to lower the temperatures at which the material is mixed and placed on the road between 10 and 100 degrees F.

**\*18. Did any of your plants in this state use Warm-Mix Asphalt technologies in 2011?**

- ☐ Yes
- ☐ No

## Warm Mix Asphalt Production for 2011

Warm-mix asphalt is the generic term for a variety of technologies that allow the producers of hot-mix asphalt pavement material to lower the temperatures at which the material is mixed and placed on the road between 10 and 100 degrees F.

**\*19. What was average percent of mix produced using Warm-Mix-Asphalt technologies in 2011 for the different categories? (Use best estimate if data not available)**

State DOT

Other Agencies (city, county, FAA, military)

Commercial & residential

**\*20. What percentage of the total warm-mix asphalt (WMA) for 2011 was produced using the following technologies? (Use best estimate if data not available)**

Chemical admixture

Additive (zeolite) foaming

Plant foaming

Organic (wax) additive

## Thank You

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

- ☐ Yes
- ☐ No



2<sup>nd</sup> Annual Asphalt Pavement  
Industry Survey on  
Reclaimed Asphalt Pavement,  
Reclaimed Asphalt Shingles,  
and Warm-mix Asphalt Usage:  
2009–2011

Appendix B  
State-by-State Use of RAP, RAS, WMA and HMA

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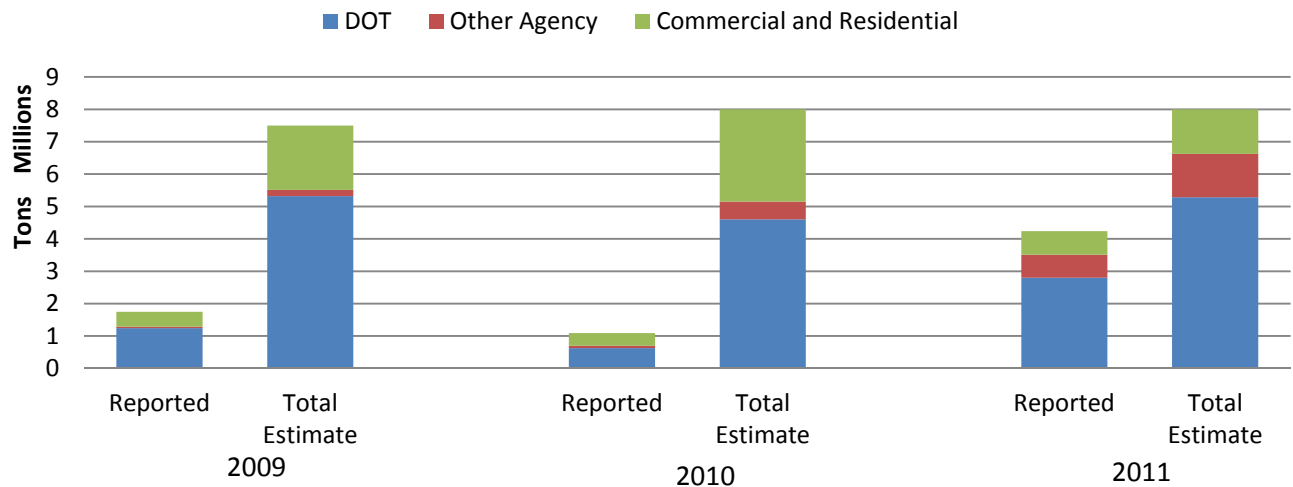
## Alabama

Table B1 summarizes the results received from asphalt mix producers in Alabama. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 3 for 2009&2010, 5 for 2011

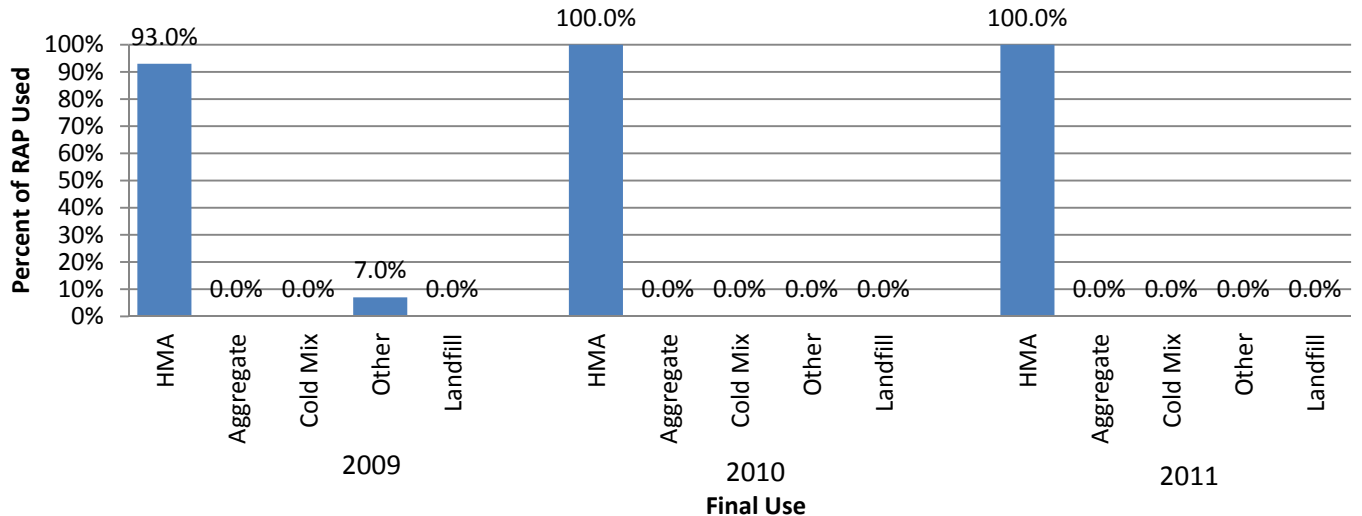
#### Alabama Total Plant Produced Mix



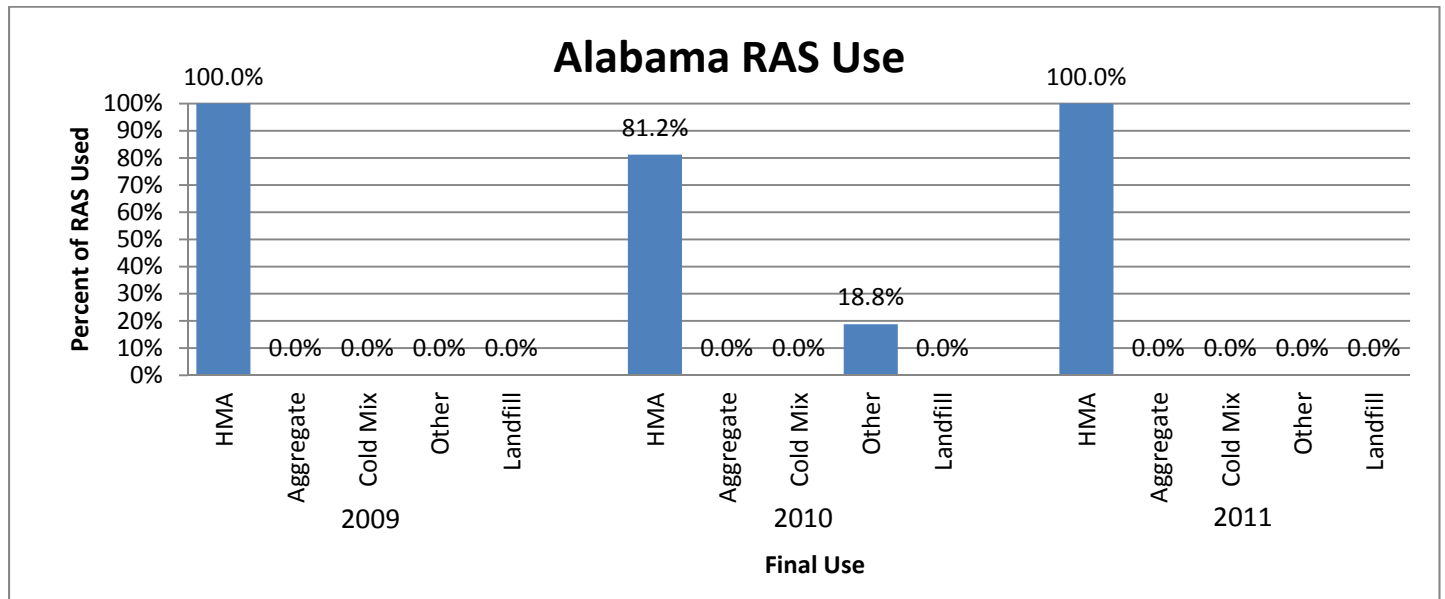
The total estimated tonnage for the state was provided by the Alabama Asphalt Pavement Association. The ratios of DOT, other agency, and commercial and residential tons to the reported values were used to calculate total tonnages for these three categories.

### RAP Use

#### Alabama RAP Use



## RAS Use



## WMA Use

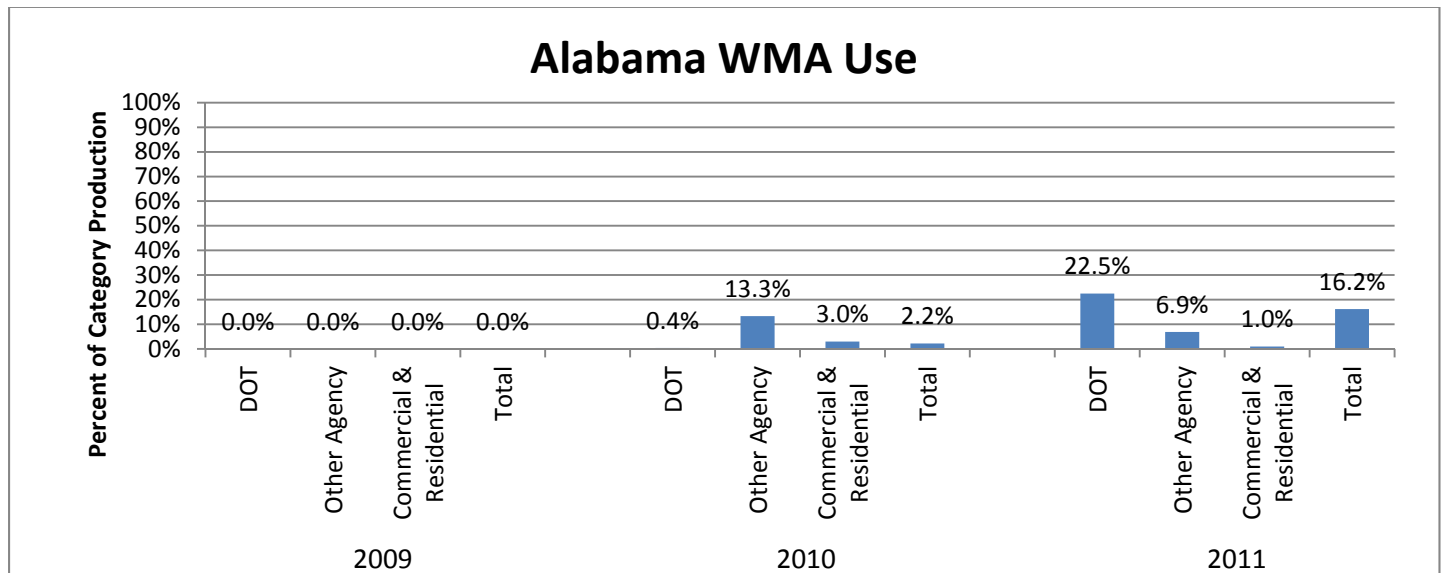


Table B 1 Summary of Alabama Data for 2011

No. Companies Reporting

5

HMA/WMA		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	2,800,935	5,286,830
Total Other Agency Tonnage	709,356	1,338,926
Total Commercial & Residential Tonnage	728,068	1,374,245
Total Tonnage	4,238,359	8,000,000
Reclaimed Asphalt Pavement (RAP)		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	1,191,308	2,248,621
RAP Tons used in HMA/WMA	897,861	1,694,733
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	19%	
Average % RAP in Other Agency Mixes	22%	
Average % RAP in Commercial & Residential Mixes	26%	
Reclaimed Asphalt Shingles (RAS)		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	80%	
RAS Tons Received	71,740	135,411
RAS Tons used in HMA/WMA	61,991	117,009
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	2%	
Average % RAS in Other Agency Mixes	2%	
Average % RAS in Commercial & Residential Mixes	4%	
Warm-Mix Asphalt		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	629,930	1,189,007
WMA Other Agency Tonnage	48,964	92,421
WMA Commercial & Residential Tonnage	7,665	14,468
Total WMA Tonnage	686,559	1,295,896
Percent WMA Tons using Chemical Additives	26.1%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	73.9%	
Percent WMA Tons using Organic Additive	0.0%	

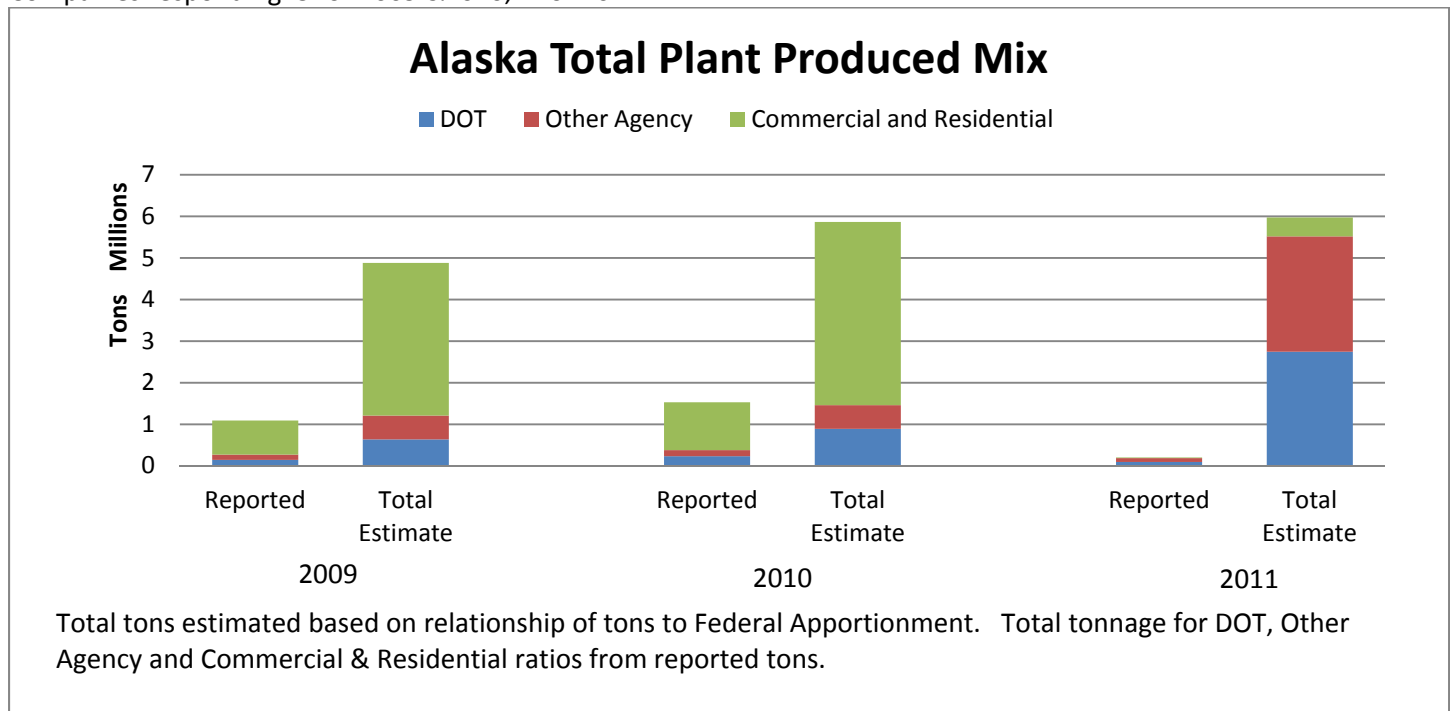
1. Total tonnage provided by Alabama Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Alaska

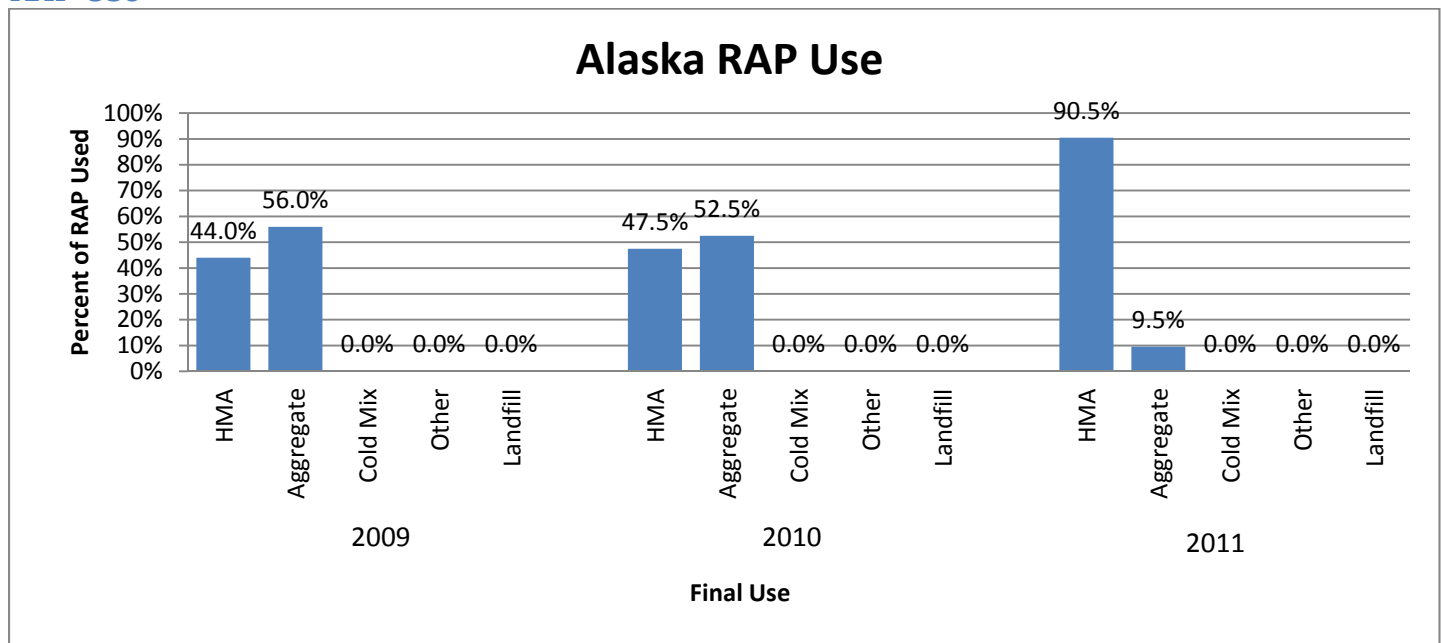
Table B2 summarizes the results received from asphalt mix producers in Alaska. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 3 for 2009 & 2010, 2 for 2011



### RAP Use



### RAS Use

No companies reported using RAS in 2009, 2010 or 2011.

## WMA Use

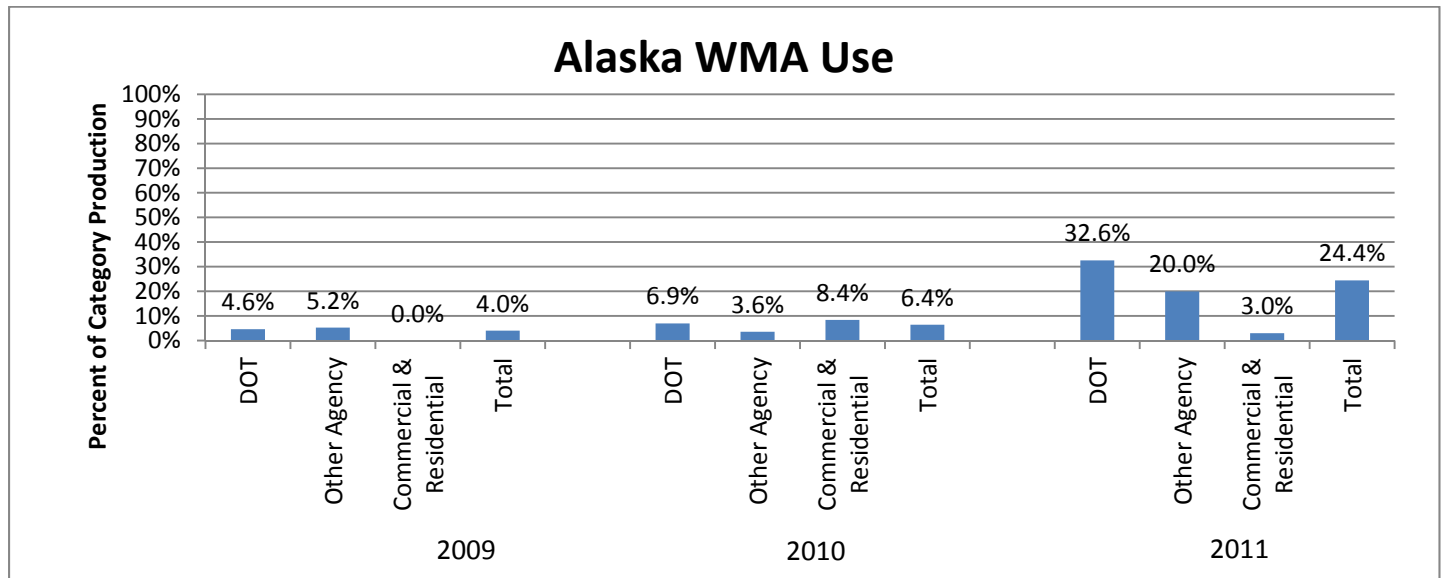


Table B 2: Summary of Alaska Data for 2011

No. Companies Reporting

2

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	93,250	2,743,863
Total Other Agency Tonnage	94,280	2,774,170
Total Commercial & Residential Tonnage	15,530	456,967
Total Tonnage	203,060	5,975,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	42,500	1,250,554
RAP Tons used in HMA/WMA	27,050	795,941
RAP Tons used as Aggregate	2,850	83,861
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	10%	
Average % RAP in Other Agency Mixes	7%	
Average % RAP in Commercial & Residential Mixes	16%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	50%	
WMA DOT Tonnage	30,360	893,337
WMA Other Agency Tonnage	18,810	553,480
WMA Commercial & Residential Tonnage	430	12,653
Total WMA Tonnage	49,600	1,459,470
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

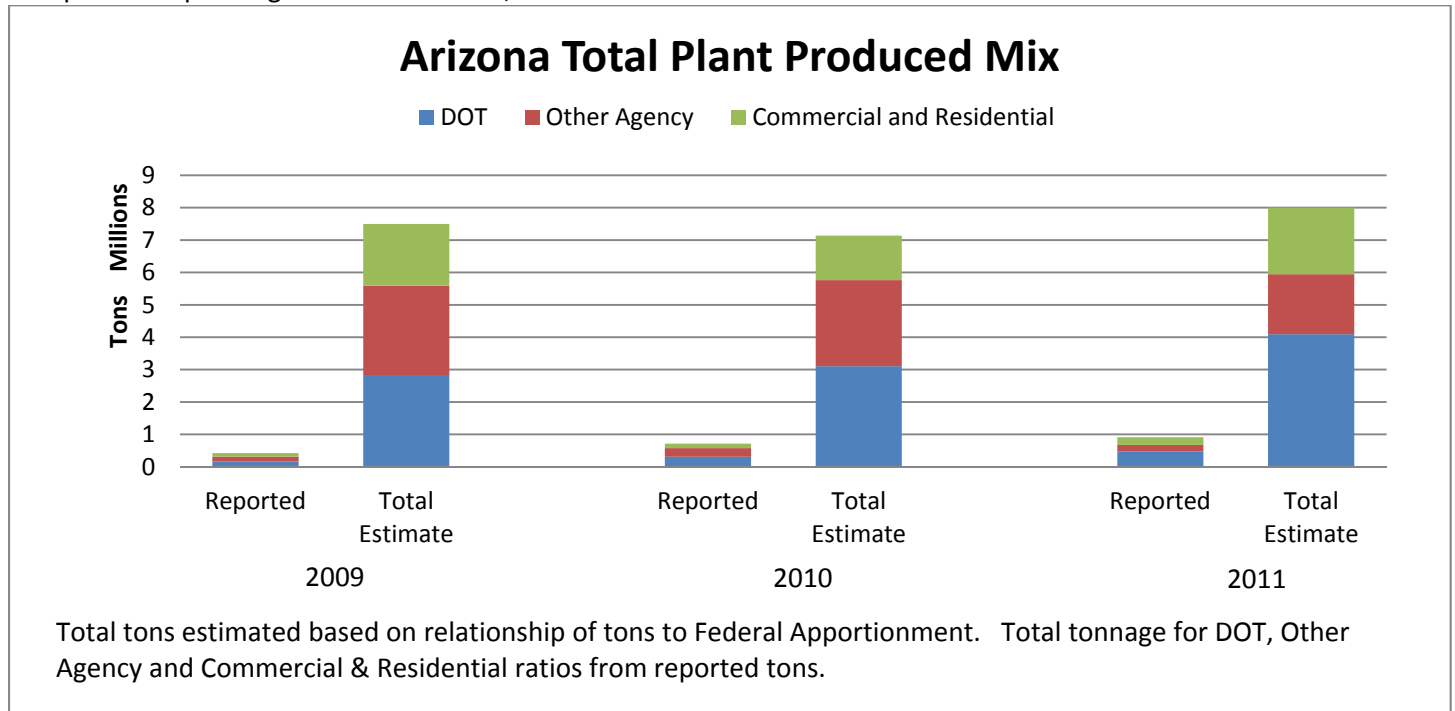
1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Arizona

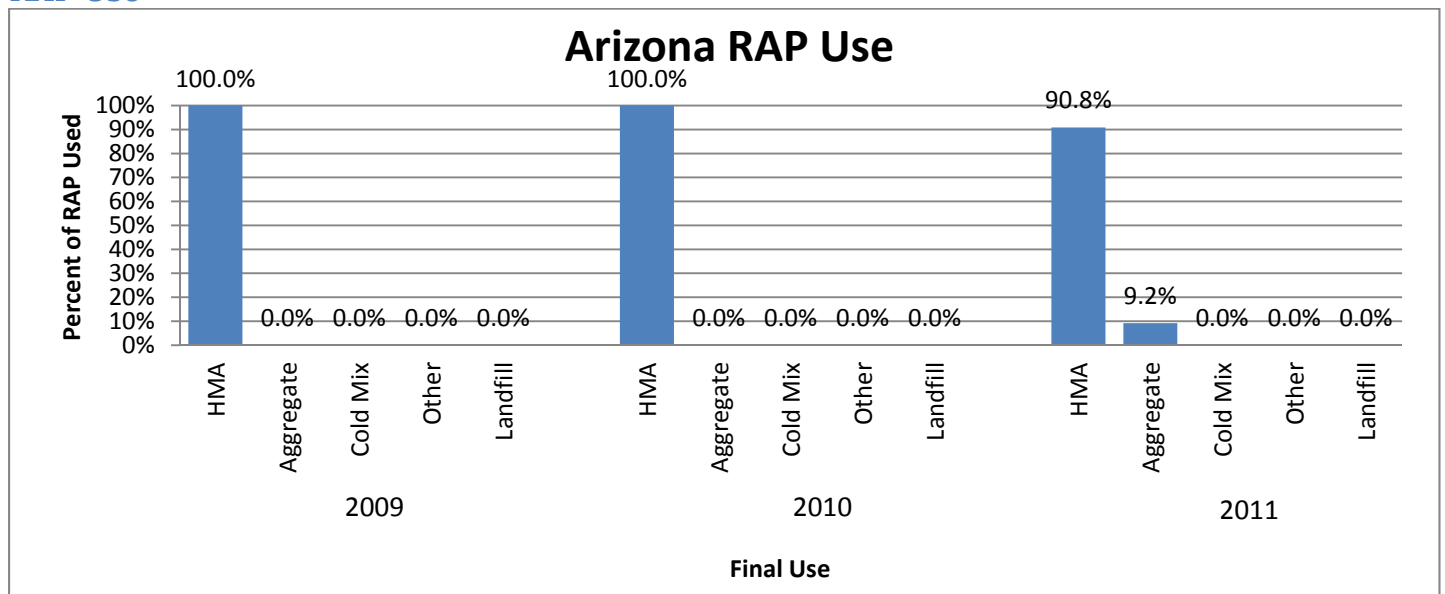
Table B3 summarizes the results received from asphalt mix producers in Arizona. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 2 for 2009 & 2010, 4 for 2011



### RAP Use



### RAS Use

No companies reported using RAS in 2009, 2010 or 2011.



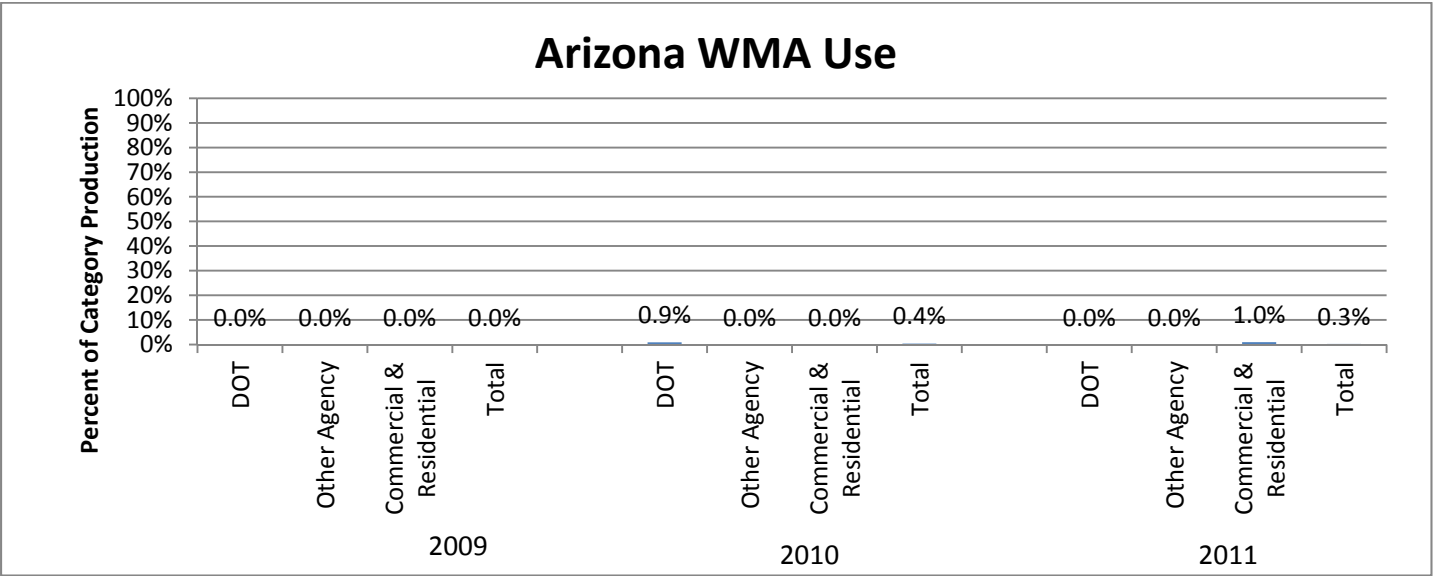


Table B 3: Summary of Arizona Data for 2011

Companies Reporting

4

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	465,202	4,094,201
Total Other Agency Tonnage	210,634	1,853,771
Total Commercial & Residential Tonnage	233,161	2,052,029
Total Tonnage	908,997	8,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	134,200	1,181,082
RAP Tons used in HMA/WMA	98,545	867,286
RAP Tons used as Aggregate	9,940	87,481
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	10%	
Average % RAP in Other Agency Mixes	5%	
Average % RAP in Commercial & Residential Mixes	17%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	25%	
WMA DOT Tonnage	-	-
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	2,285	20,106
Total WMA Tonnage	2,285	20,106
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

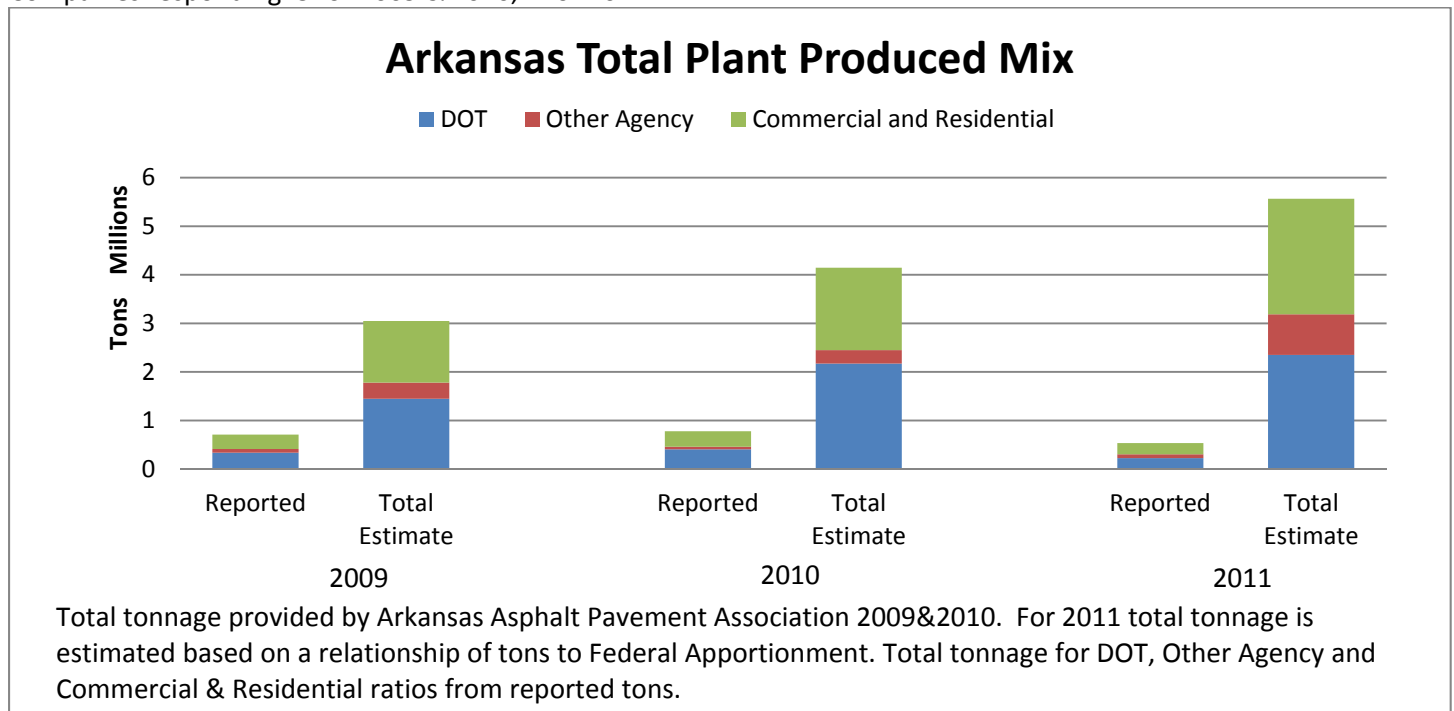
1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Arkansas

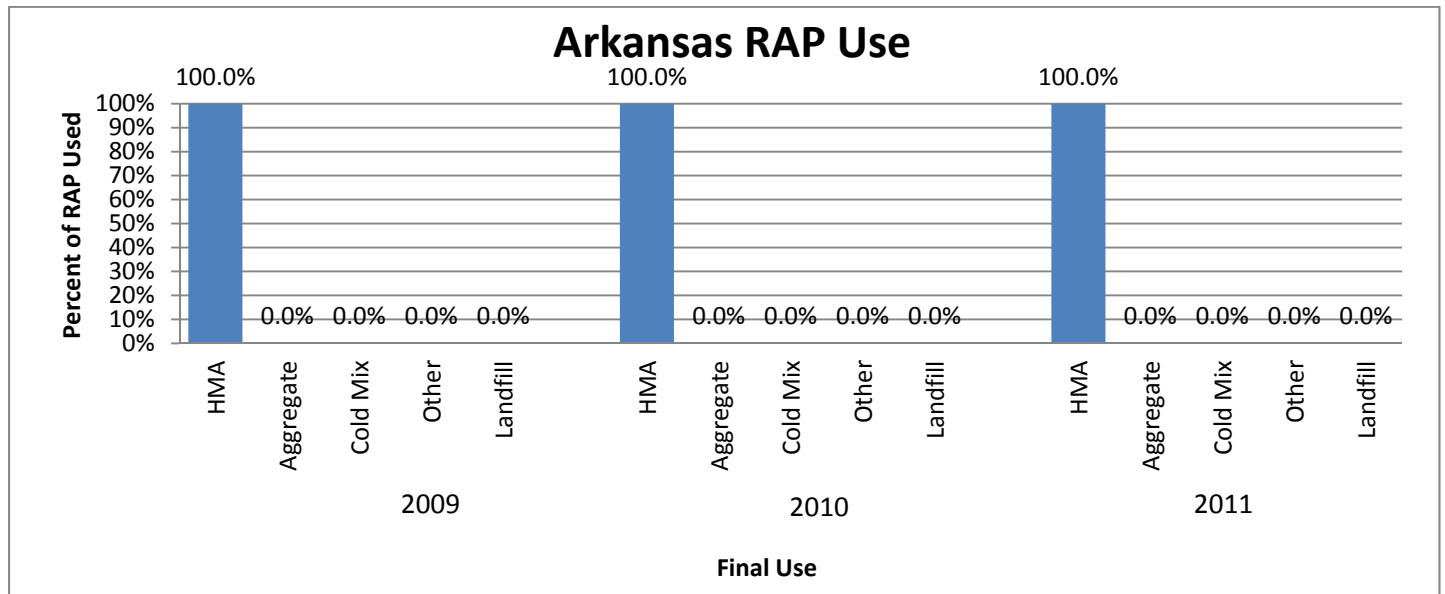
Table B4 summarizes the results received from asphalt mix producers in Arkansas.

### Total Asphalt Mix Tonnage

Companies responding: 3 for 2009 & 2010, 2 for 2011

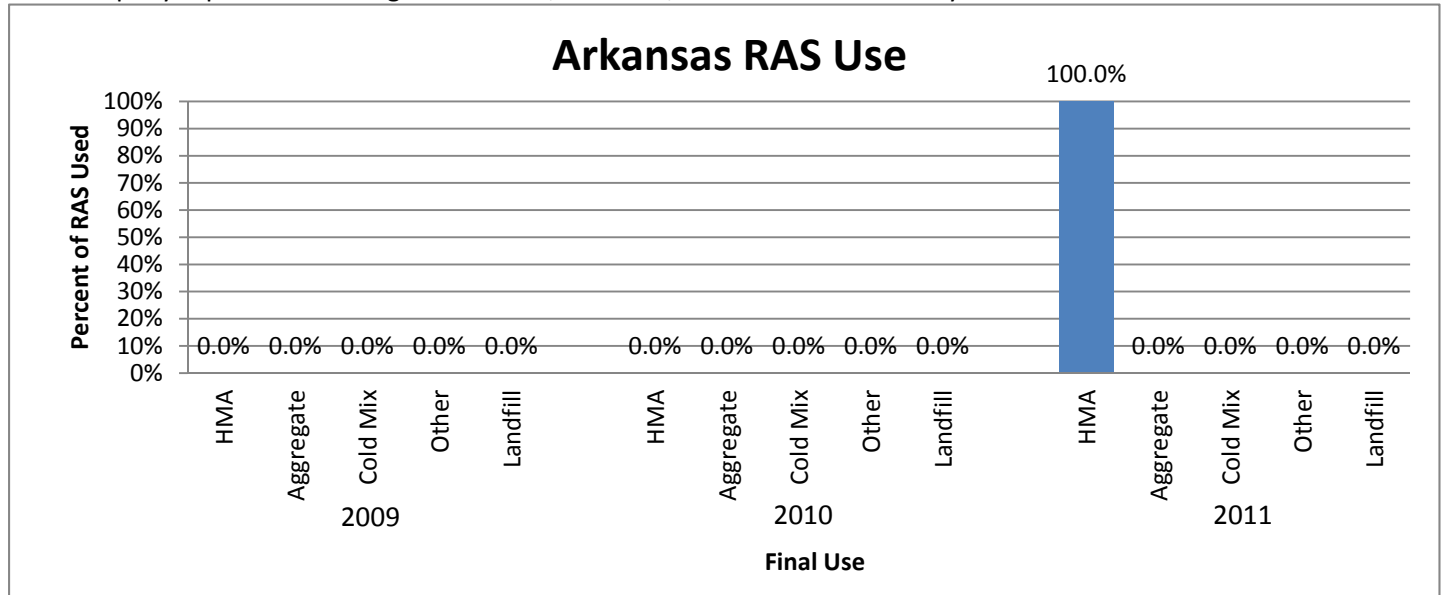


### RAP Use



## RAS Use

One company reported receiving RAS in 2010; however, no RAS was used in any mixes in 2009 & 2010.



## WMA Use

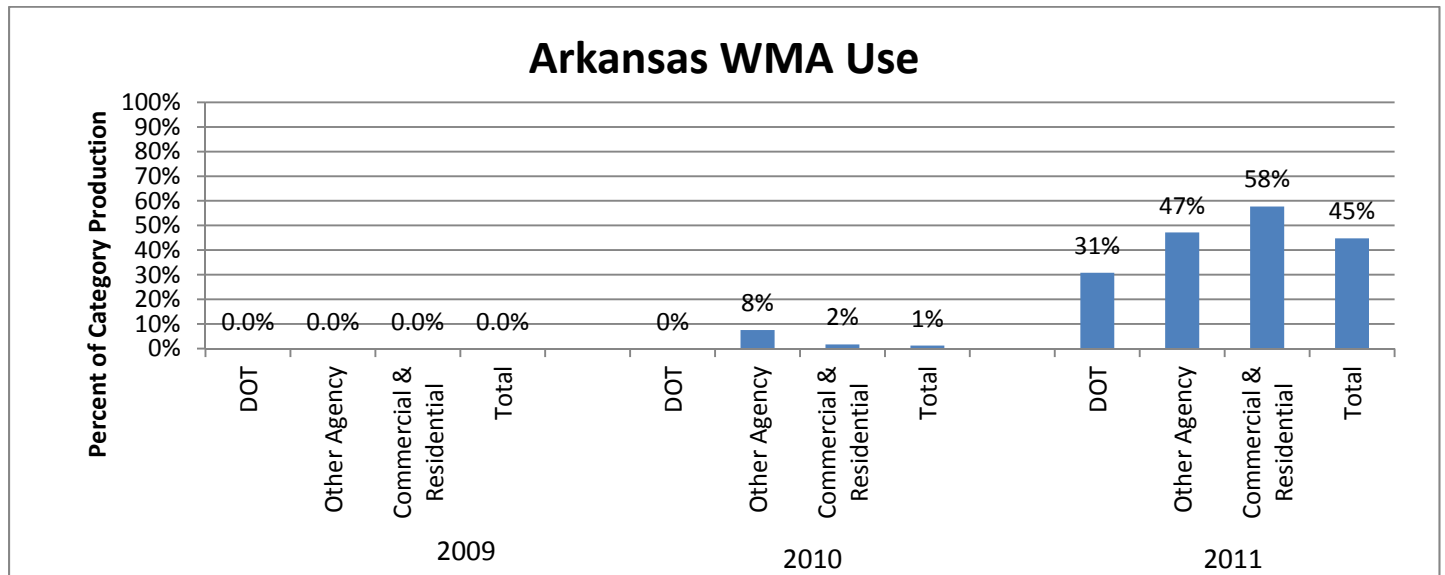


Table B 4: Arkansas Summary for 2011

Companies Reporting

2

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	225,663	2,350,700
Total Other Agency Tonnage	80,109	834,484
Total Commercial & Residential Tonnage	228,362	2,378,815
Total Tonnage	534,134	5,564,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	59,820	623,137
RAP Tons used in HMA/WMA	51,495	536,416
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	10%	
Average % RAP in Other Agency Mixes	11%	
Average % RAP in Commercial & Residential Mixes	12%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	100%	
RAS Tons Received	28,470	296,568
RAS Tons used in HMA/WMA	5,688	59,251
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	1%	
Average % RAS in Other Agency Mixes	3%	
Average % RAS in Commercial & Residential Mixes	2%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	69,515	724,124
WMA Other Agency Tonnage	37,760	393,340
WMA Commercial & Residential Tonnage	131,719	1,372,101
Total WMA Tonnage	238,994	2,489,566
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

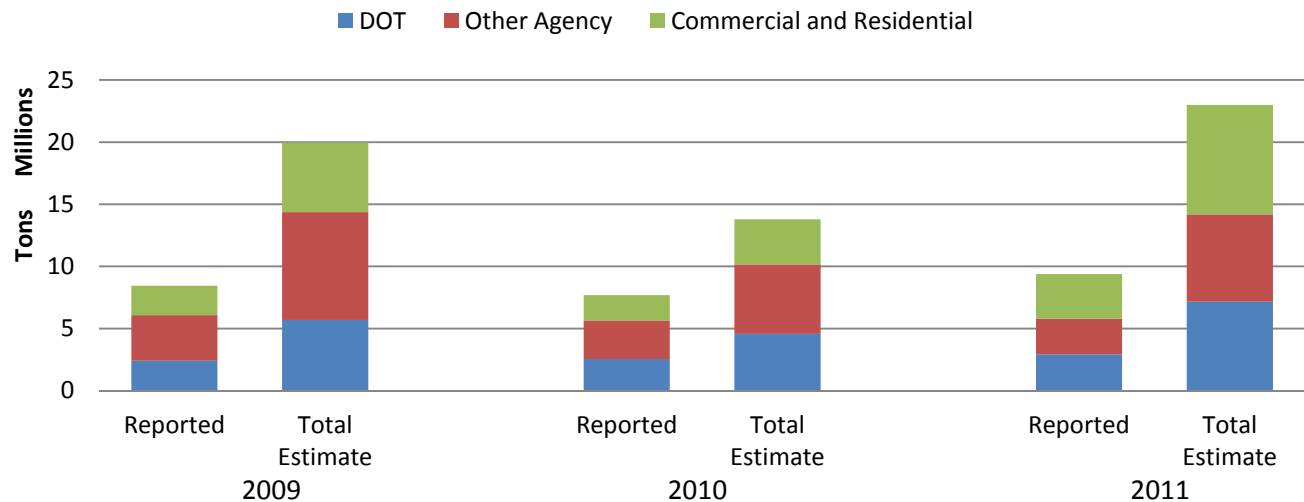
## California

Table B5 summarizes the results received from asphalt mix producers in California. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 6 for 2009 & 2010, 4 for 2011

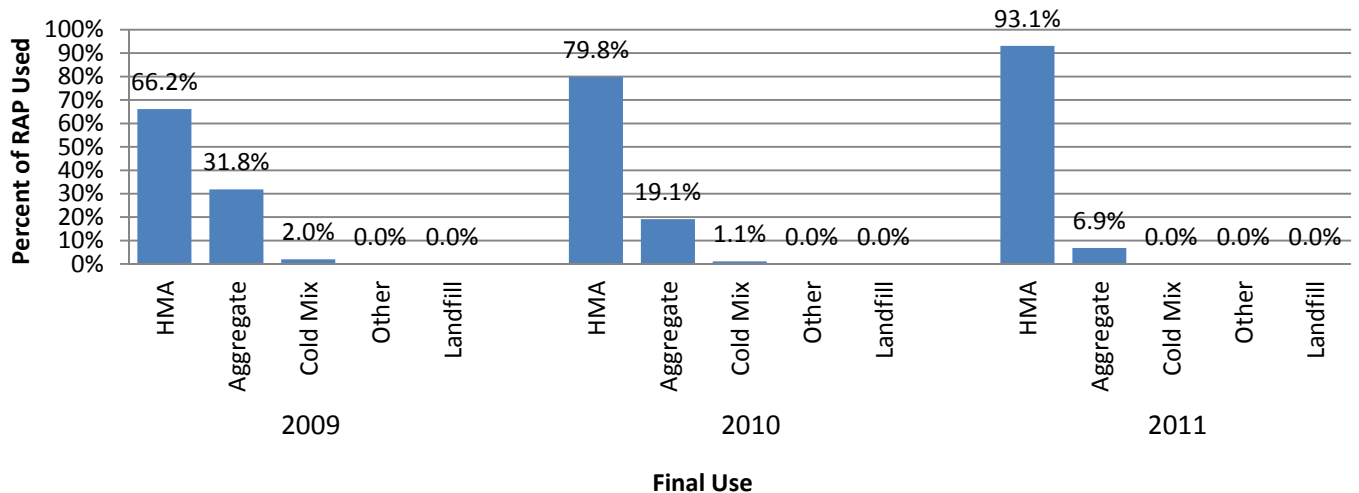
#### California Total Plant Produced Mix



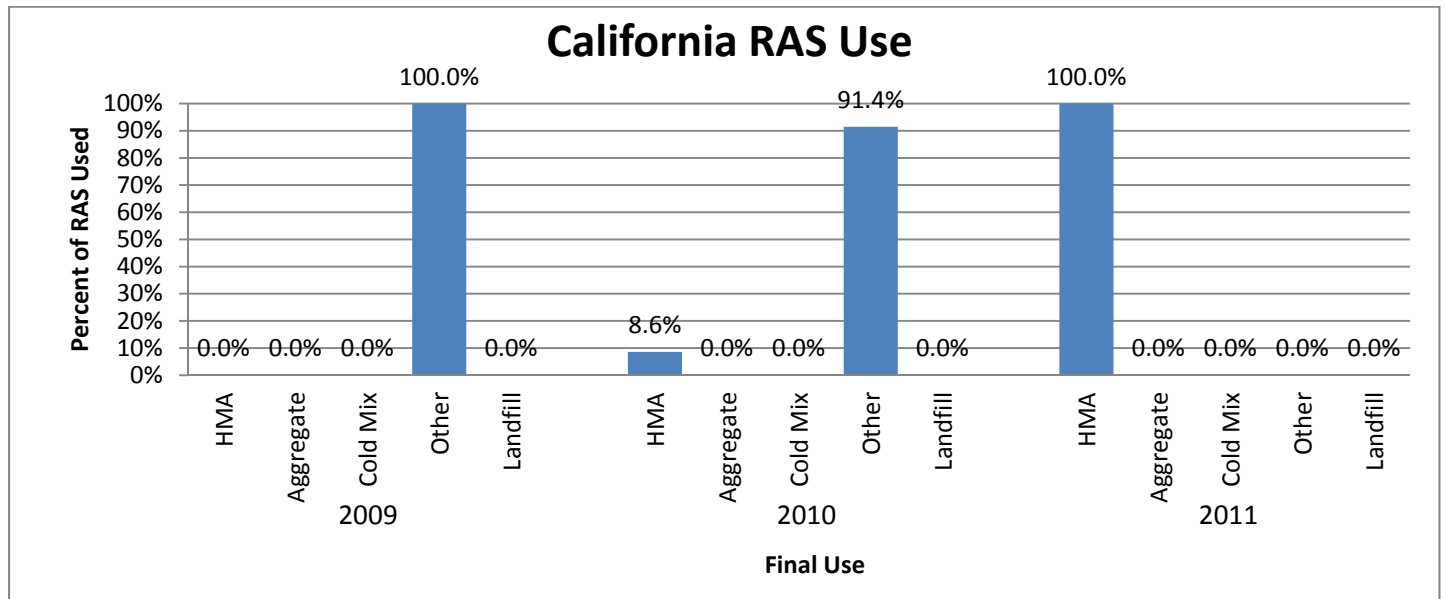
For 2009 and 2010, total DOT tonnage provided by California Asphalt Pavement Association and ratio of reported total tons to reported DOT tons used to compute estimated total tons. For 2011 the estimated tonnage provided by California Asphalt Pavement Association. Total tonnage for Other Agency and Commercial & Residential ratios from reported tons.

### RAP Use

#### California RAP Use



## RAS Use



## WMA Use

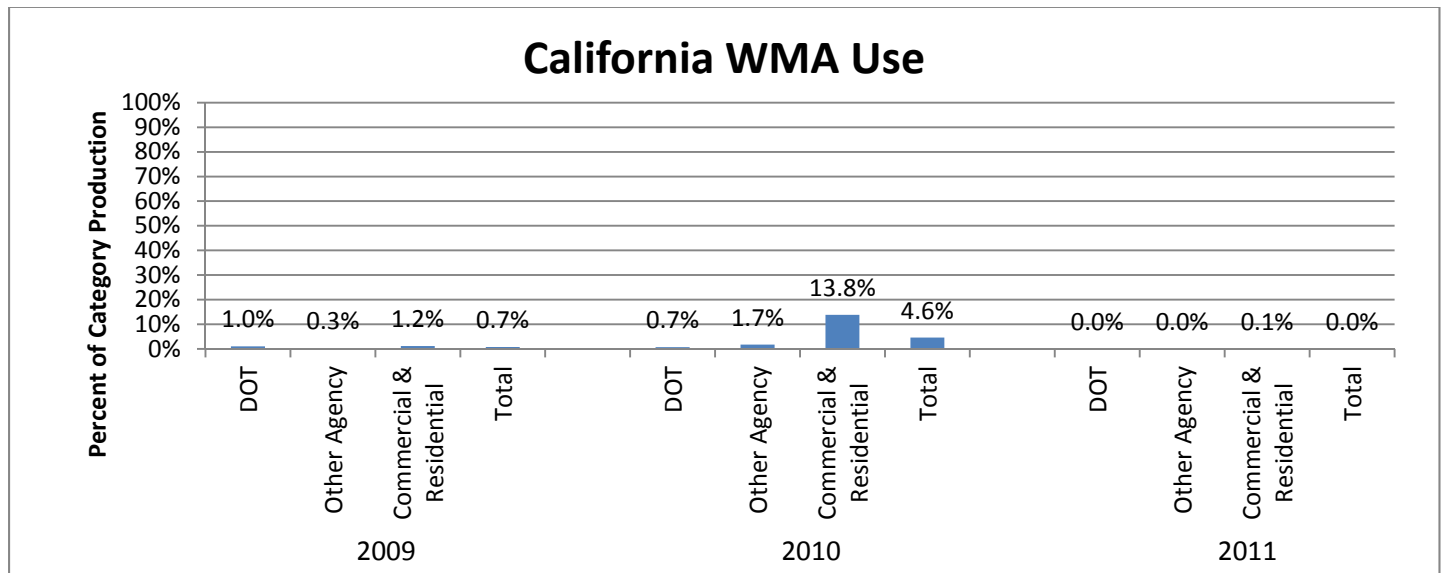


Table B 5: Summary of California Data for 2011

Companies Reporting

4

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	2,919,550	7,157,209
Total Other Agency Tonnage	2,869,550	7,034,635
Total Commercial & Residential Tonnage	3,593,000	8,808,156
Total Tonnage	9,382,100	23,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	75%	
RAP Tons Received	1,200,000	2,941,772
RAP Tons used in HMA/WMA	879,365	2,155,743
RAP Tons used as Aggregate	65,000	159,346
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	10%	
Average % RAP in Other Agency Mixes	7%	
Average % RAP in Commercial & Residential Mixes	13%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	75%	
RAS Tons Received	25,125	61,593
RAS Tons used in HMA/WMA	2,925	7,171
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	2%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	75%	
WMA DOT Tonnage	2	4
WMA Other Agency Tonnage	1,352	3,313
WMA Commercial & Residential Tonnage	3,054	7,486
Total WMA Tonnage	4,407	10,803
Percent WMA Tons using Chemical Additives	30.6%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	69.4%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tonnage provided by California Asphalt Pavement Association. Total tonnage for Other Agency and Commercial & Residential ratios from reported tons.



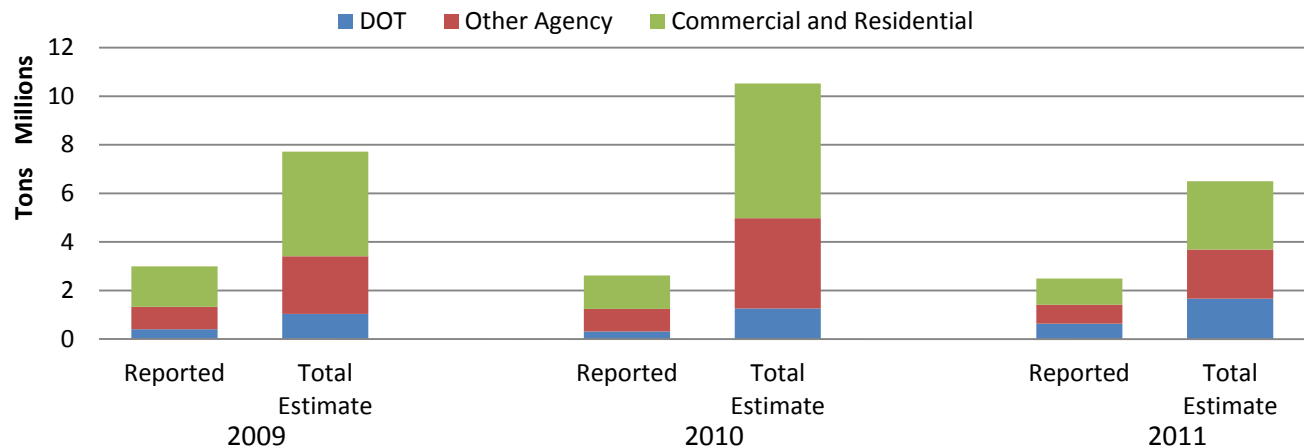
## Colorado

Table B6 summarizes the results received from asphalt mix producers in Colorado. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 8 for 2009 & 2010, 7 for 2011

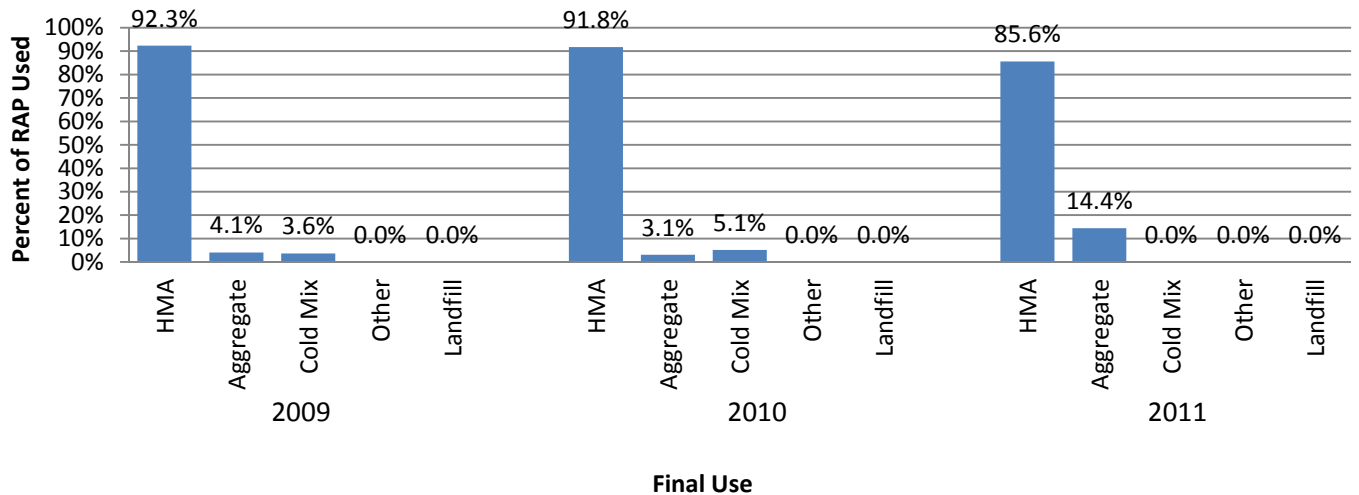
#### Colorado Total Plant Produced Mix



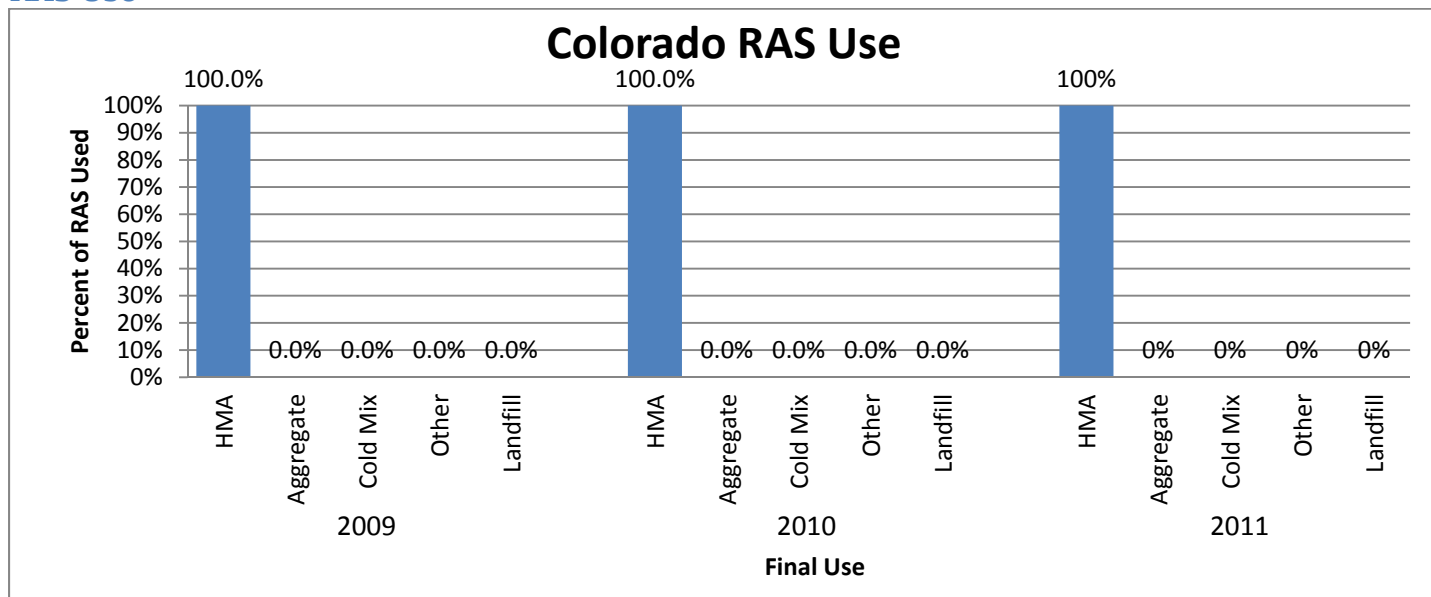
For 2009 and 2010, total DOT tonnage provided by Colorado Asphalt Pavement Association and ratio of reported total tons to reported total tons used to compute estimated total tons. For 2011 the total tonnage provided by Colorado Asphalt Pavement Association. Total tonnage for Other Agency and Commercial & Residential ratios from reported tons.

### RAP Use

#### Colorado RAP Use



## RAS Use



## WMA Use

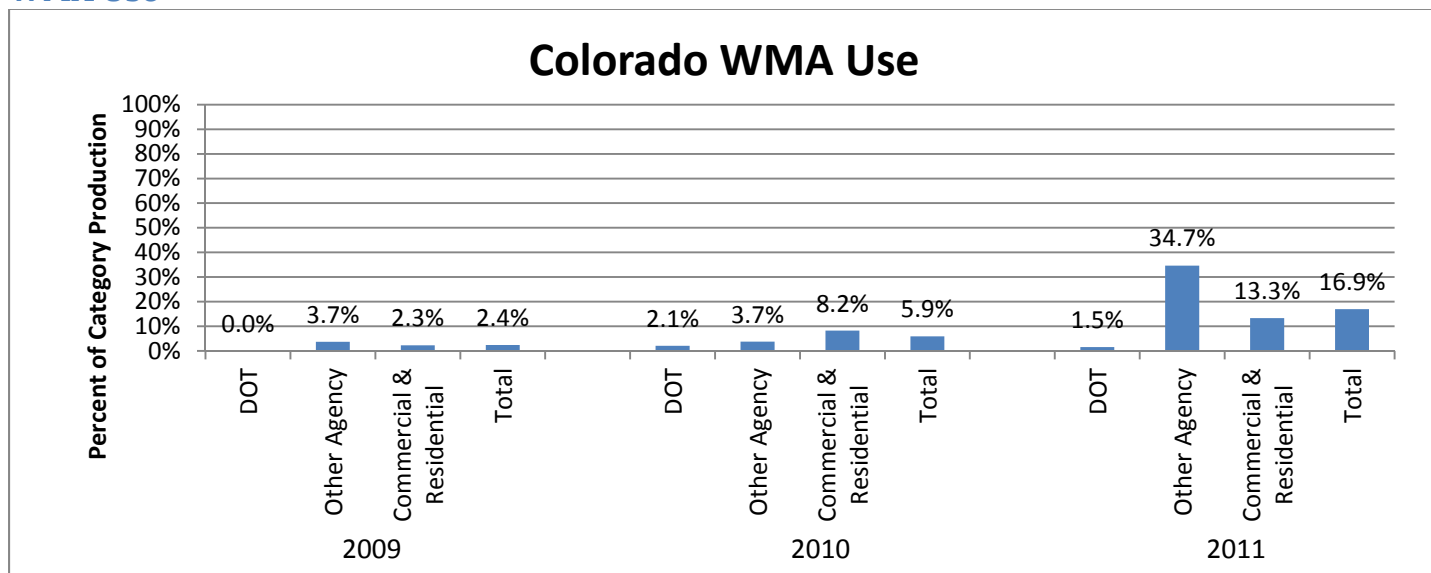


Table B 6: Summary of Colorado Data for 2011

Companies Reporting

7

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	638,781	1,663,935
Total Other Agency Tonnage	776,759	2,023,348
Total Commercial & Residential Tonnage	1,079,796	2,812,717
Total Tonnage	2,495,336	6,500,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	679,772	1,770,711
RAP Tons used in HMA/WMA	596,610	1,554,084
RAP Tons used as Aggregate	100,395	261,515
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	13%	
Average % RAP in Other Agency Mixes	21%	
Average % RAP in Commercial & Residential Mixes	31%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	14%	
RAS Tons Received	4,119	10,729
RAS Tons used in HMA/WMA	4,119	10,729
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	86%	
WMA DOT Tonnage	9,823	25,587
WMA Other Agency Tonnage	269,187	701,194
WMA Commercial & Residential Tonnage	143,921	374,895
Total WMA Tonnage	422,931	1,101,676
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

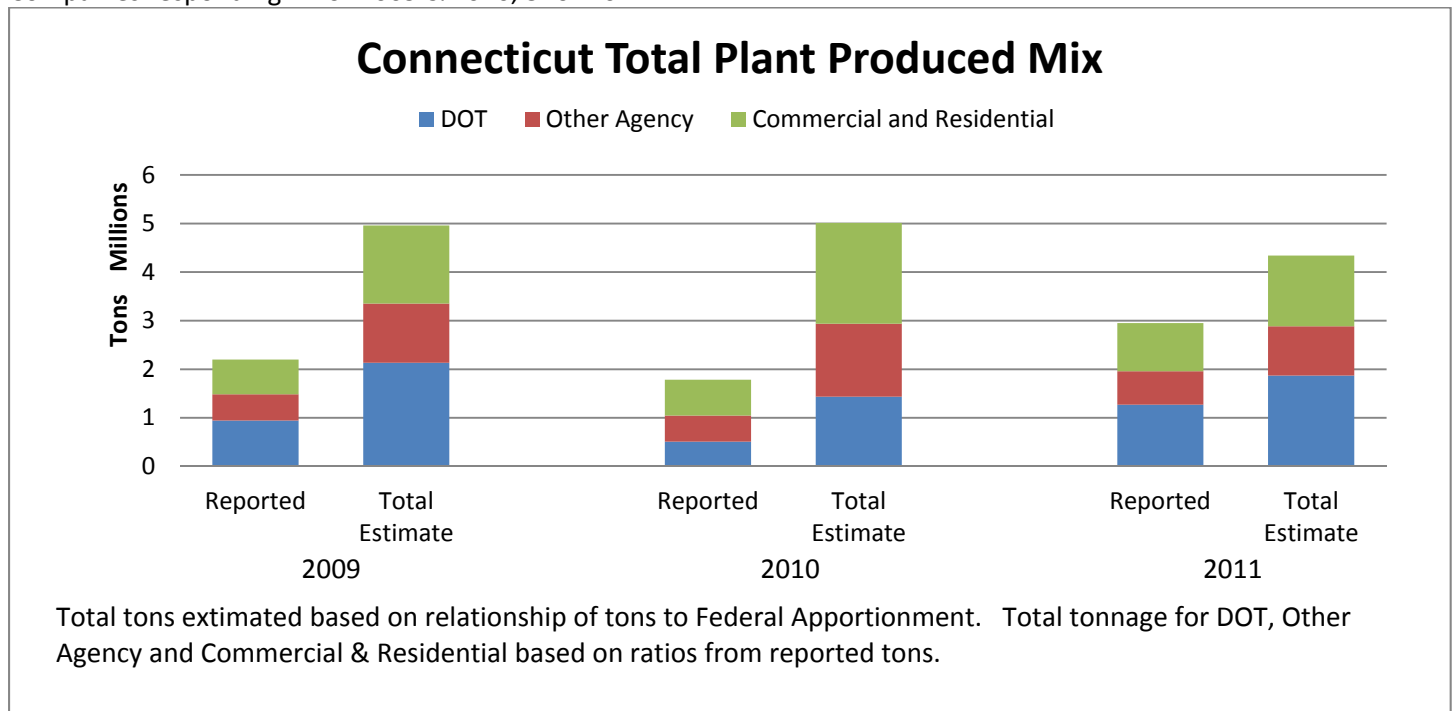
1. Total tonnage provided by Colorado Asphalt Pavement. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Connecticut

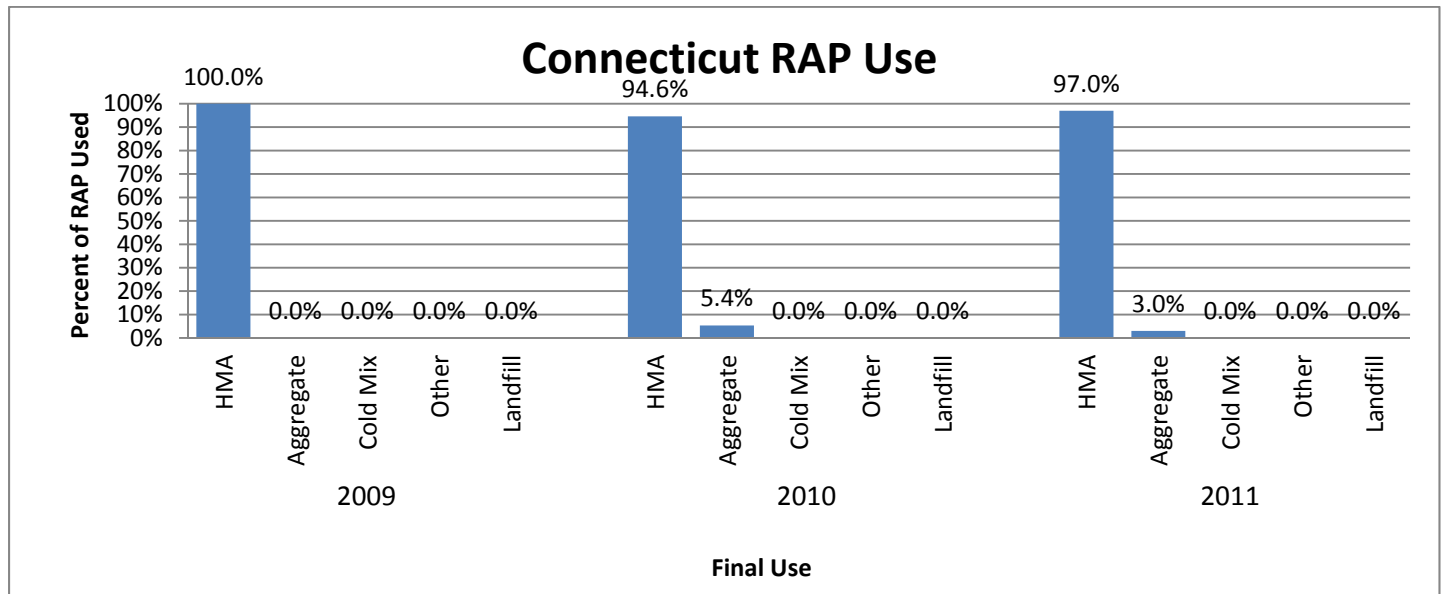
Table B7 summarizes the results received from asphalt mix producers in Connecticut. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 2 for 2009 & 2010, 3 for 2011



### RAP Use



### RAS Use

No contractors reported using RAS in 2009, 2010 or 2011.

## WMA Use

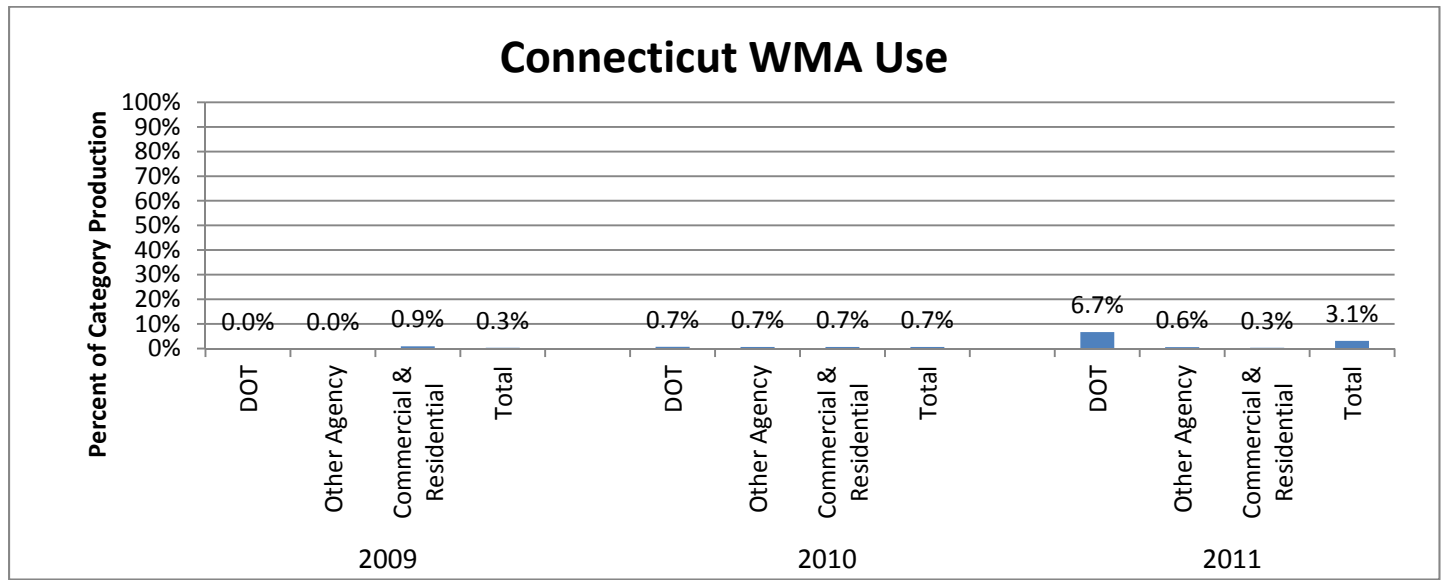


Table B 7: Summary of Connecticut Data for 2011

Companies Reporting

3

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,270,000	1,869,247
Total Other Agency Tonnage	690,000	1,015,575
Total Commercial & Residential Tonnage	989,353	1,456,177
Total Tonnage	2,949,353	4,341,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	435,000	640,254
RAP Tons used in HMA/WMA	387,533	570,390
RAP Tons used as Aggregate	12,000	17,662
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	13%	
Average % RAP in Other Agency Mixes	19%	
Average % RAP in Commercial & Residential Mixes	21%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	67%	
WMA DOT Tonnage	85,000	125,107
WMA Other Agency Tonnage	4,000	5,887
WMA Commercial & Residential Tonnage	3,297	4,852
Total WMA Tonnage	92,297	135,847
Percent WMA Tons using Chemical Additives	48.8%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	30.7%	
Percent WMA Tons using Organic Additive	20.5%	

1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

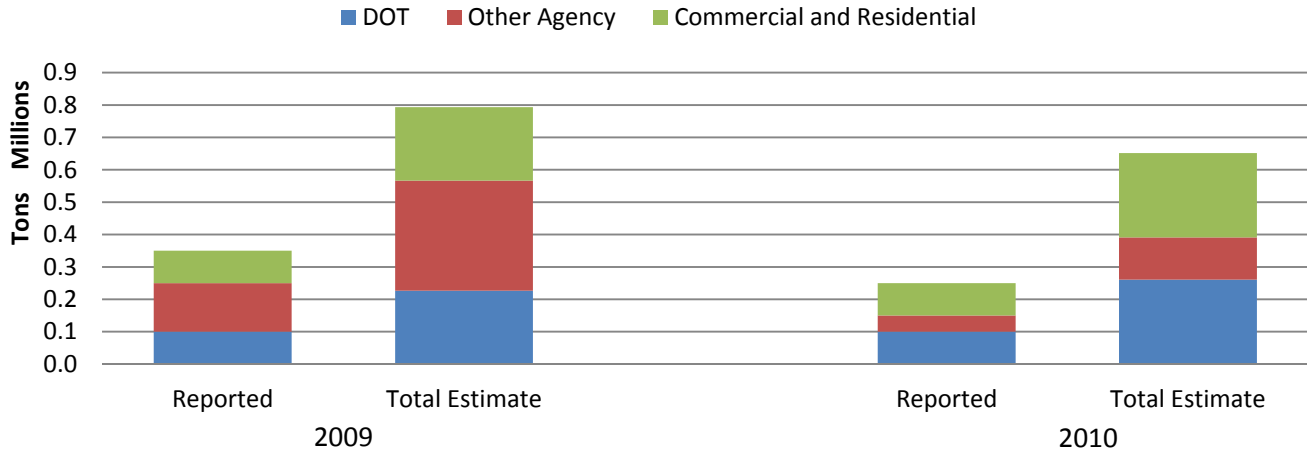
## Delaware

Table B8 summarizes estimated asphalt mix and RAP use in Delaware for 2011 because no data was received from Delaware for 2011. The charts are used to summarize statistics calculated from information provided by the 2009 – 2010 survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 1 for 2009 and 2010. No data reported for 2011

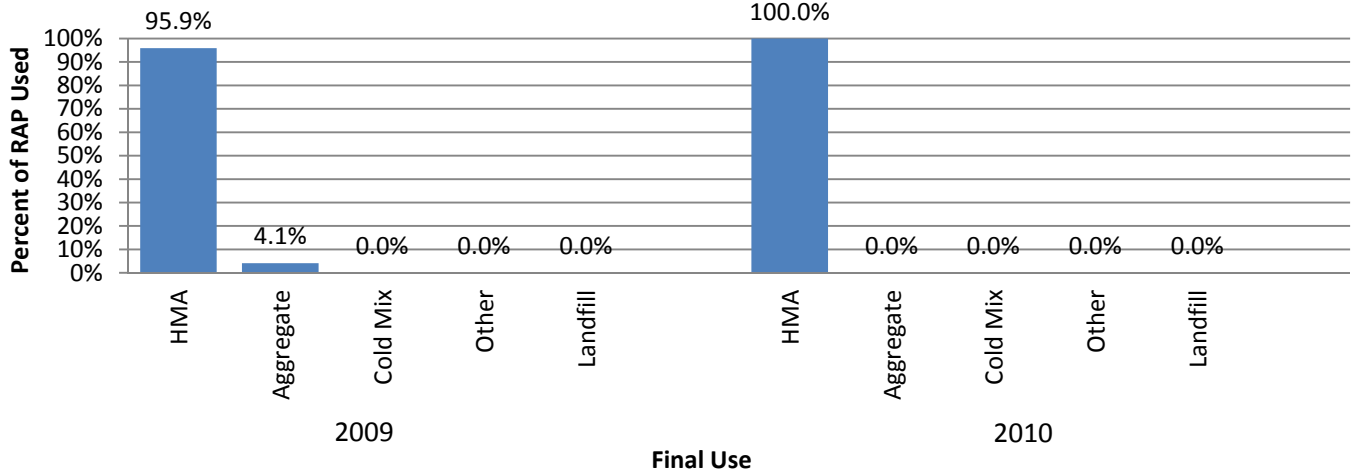
#### Delaware Total Plant Produced Mix



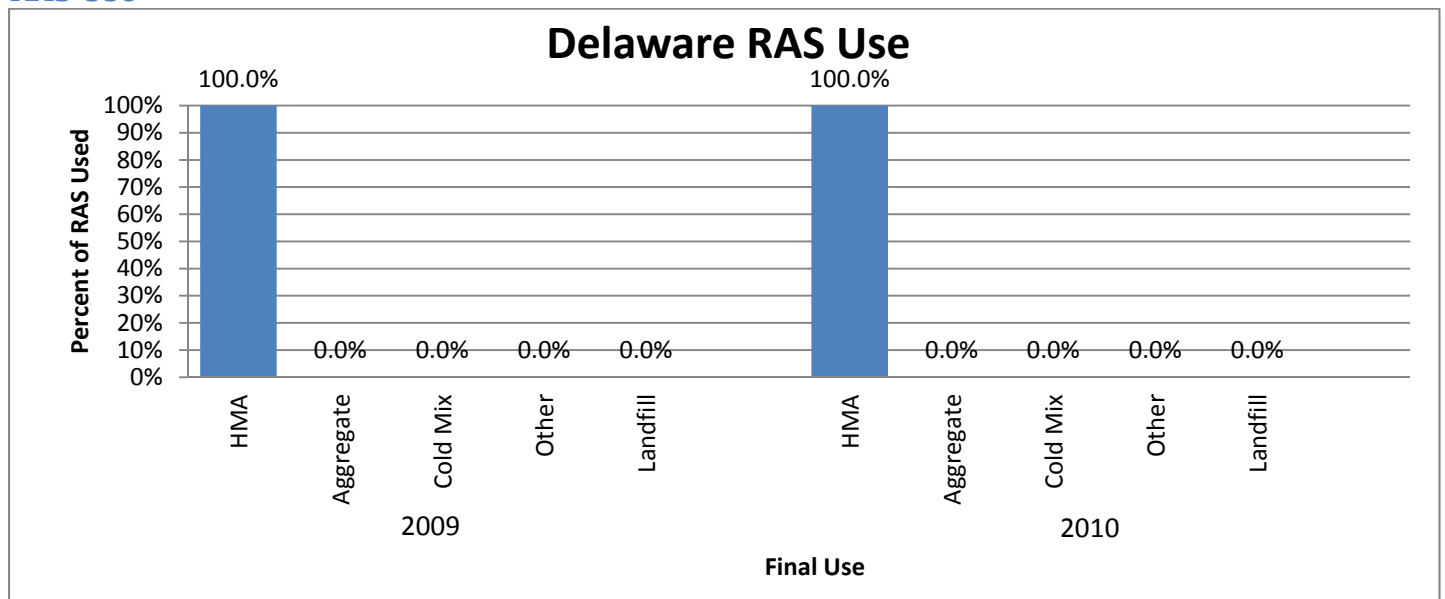
Total tonnage provided by Delaware Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential based on ratios from reported tons.

### RAP Use

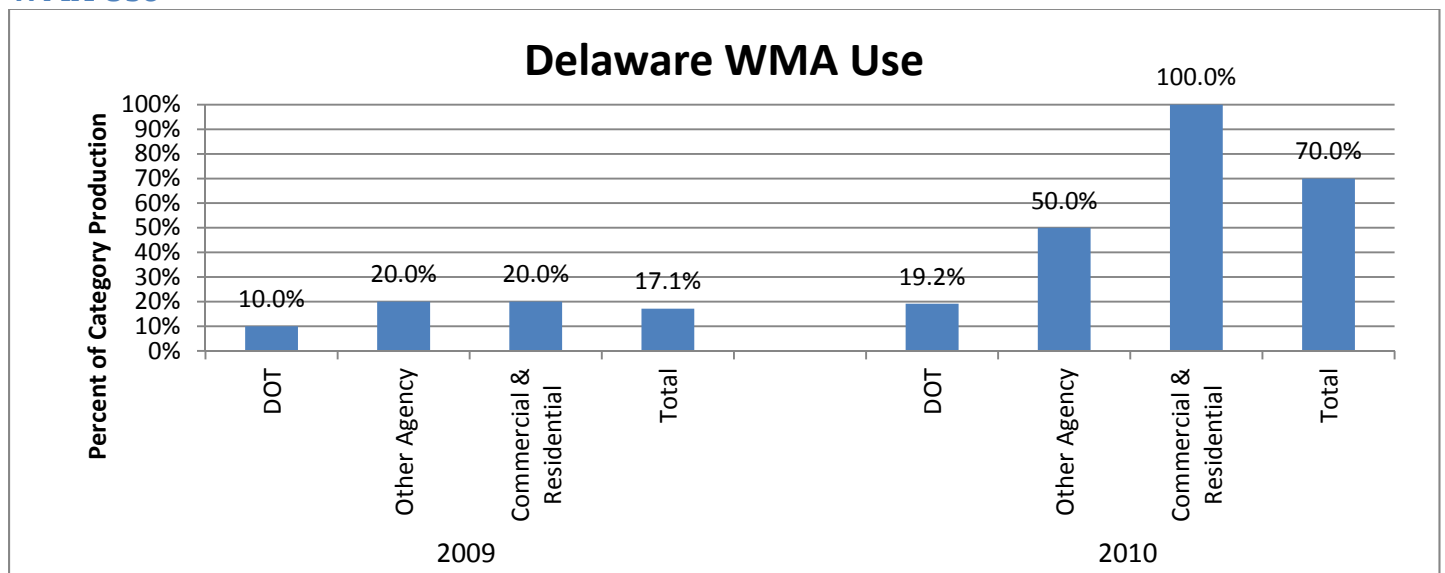
#### Delaware RAP Use



## RAS Use



## WMA Use





No contractors submitted data for Delaware for 2011. Total tons were estimated based on a relationship tons to federal apportionment. Because RAP use is prevalent in all areas of the US it was estimated that RAP use in Delaware followed a national average. Table B8 summarizes this data.

**Table B 8: Summary of Delaware Data for 2011**

Companies Reporting	0
<b>HMA/WMA</b>	
	Total Estimated <sup>1</sup>
	2011
Total DOT Tonnage	-
Total Other Agency Tonnage	-
Total Commercial & Residential Tonnage	-
Total Tonnage	2,084,000
<b>Reclaimed Asphalt Pavement (RAP)</b>	
	Total Estimated
	2011
Percent Companies using RAP	
RAP Tons Received	448,487
RAP Tons used in HMA/WMA	377,792
RAP Tons used as Aggregate	29,753
RAP Tons used in Cold Mix	1,280
RAP Tons used as Other	5,159
RAP Tons Landfilled	1,514
Average % RAP in DOT Mixes	
Average % RAP in Other Agency Mixes	
Average % RAP in Commercial & Residential Mixes	
1. Total tons estimated based on relationship of tons to Federal Apportionment.	

## District of Columbia

No contractors submitted data for the District of Columbia for 2009, 2010 or 2011. Total tons were estimated based on a relationship tons to federal apportionment. Because RAP use is prevalent in all areas of the US it was estimated that RAP use in the District followed a national average. Table B9 summarizes this data.

Table B 9: Summary of District of Columbia Data for 2011

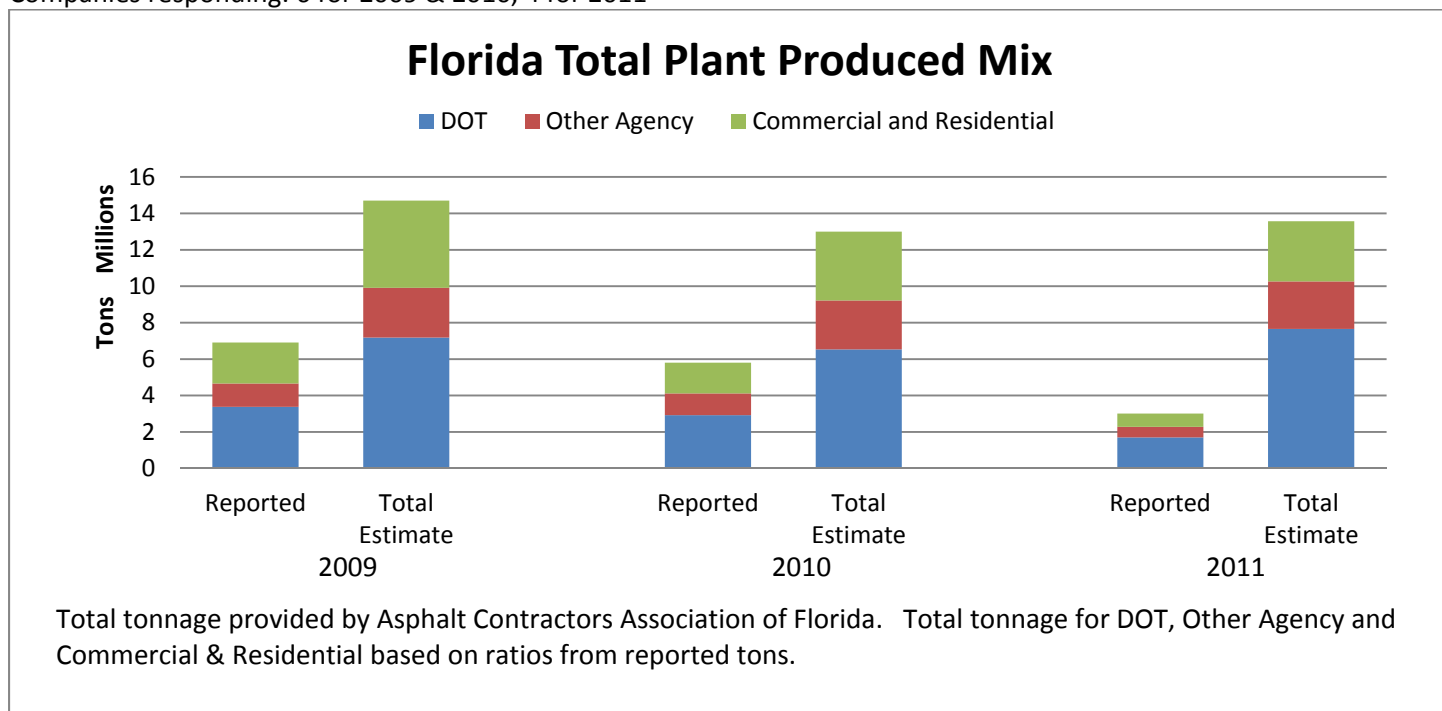
Companies Reporting	0
<b>HMA/WMA</b>	
	Total Estimated <sup>1</sup>
	2009
Total DOT Tonnage	-
Total Other Agency Tonnage	-
Total Commercial & Residential Tonnage	-
Total Tonnage	1,711,000
<b>Reclaimed Asphalt Pavement (RAP)</b>	
	Total Estimated
	2009
Percent Companies using RAP	
RAP Tons Received	369,799
RAP Tons used in HMA/WMA	311,693
RAP Tons used as Aggregate	22,947
RAP Tons used in Cold Mix	903
RAP Tons used as Other	3,495
RAP Tons Landfilled	1,243
Average % RAP in DOT Mixes	
Average % RAP in Other Agency Mixes	
Average % RAP in Commercial & Residential Mixes	
1. Total tons estimated based on relationship of tons to Federal Apportionment.	

## Florida

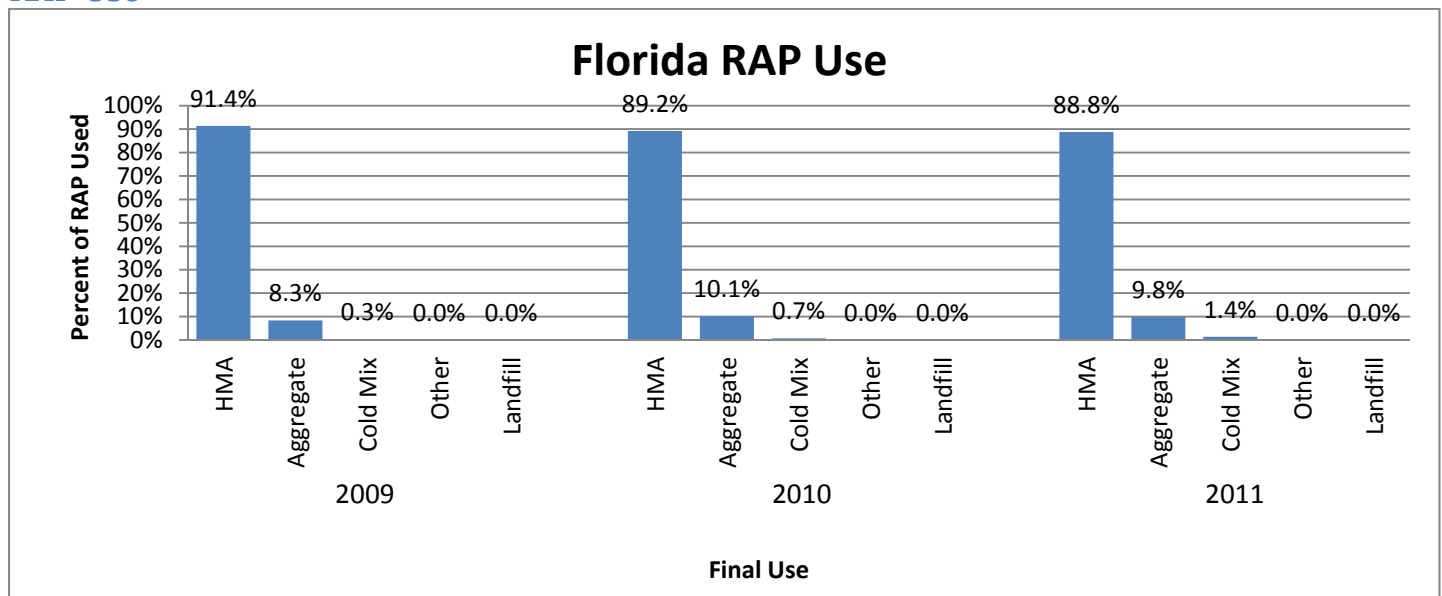
Table B10 summarizes the results received from asphalt mix producers in Florida. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

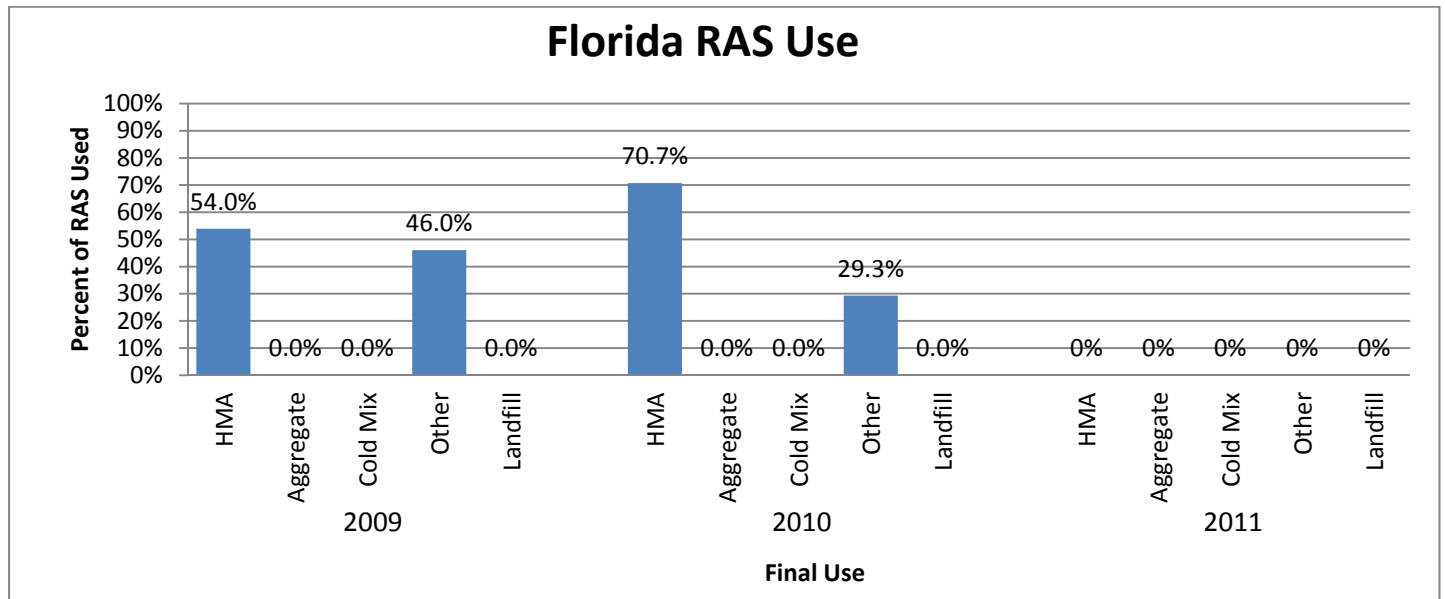
Companies responding: 6 for 2009 & 2010, 4 for 2011



### RAP Use



## RAS Use



## WMA Use

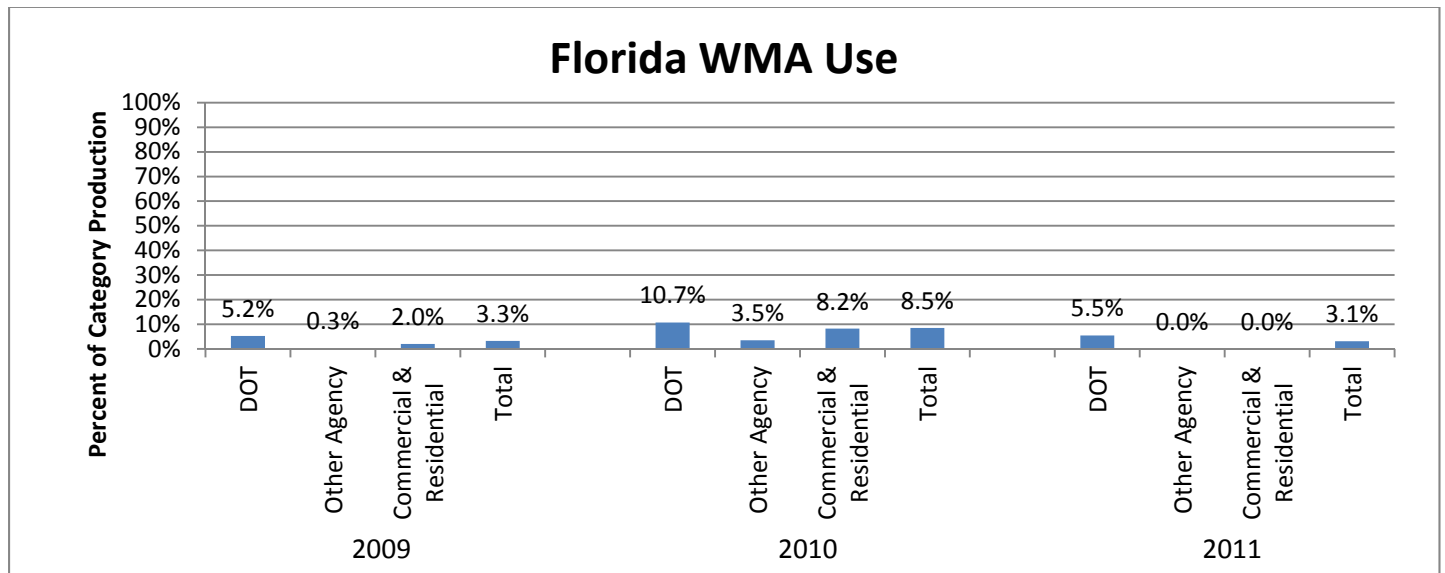


Table B 10: Summary Florida Data for 2011

Companies Reporting

4

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,699,531	7,655,946
Total Other Agency Tonnage	579,786	2,611,786
Total Commercial & Residential Tonnage	732,843	3,301,268
Total Tonnage	3,012,160	13,569,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	1,005,135	4,527,871
RAP Tons used in HMA/WMA	906,685	4,084,379
RAP Tons used as Aggregate	100,000	450,474
RAP Tons used in Cold Mix	14,092	63,481
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	31%	
Average % RAP in Other Agency Mixes	26%	
Average % RAP in Commercial & Residential Mixes	37%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	50%	
WMA DOT Tonnage	93,153	419,631
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	-	-
Total WMA Tonnage	93,153	419,631
Percent WMA Tons using Chemical Additives	12.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	88.0%	
Percent WMA Tons using Organic Additive	0.0%	

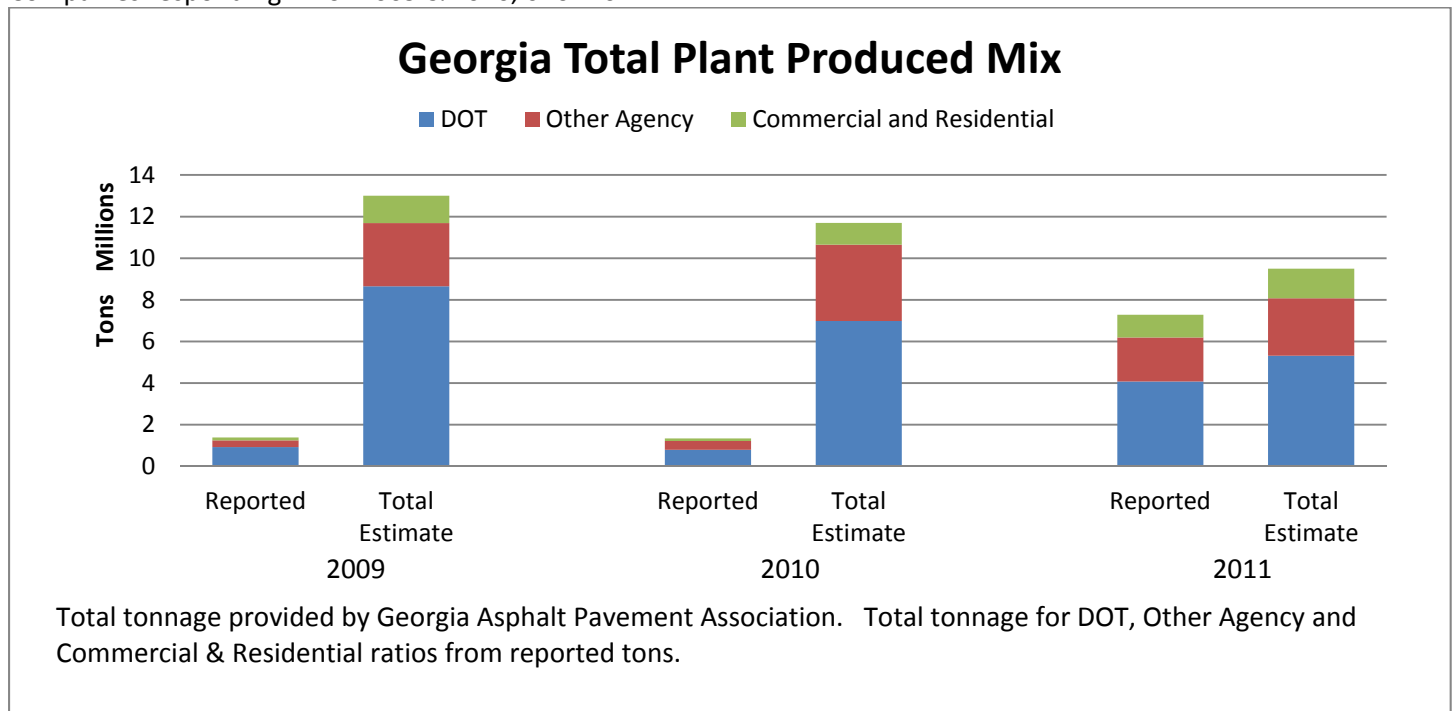
1. Total tonnage provided by Florida Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Georgia

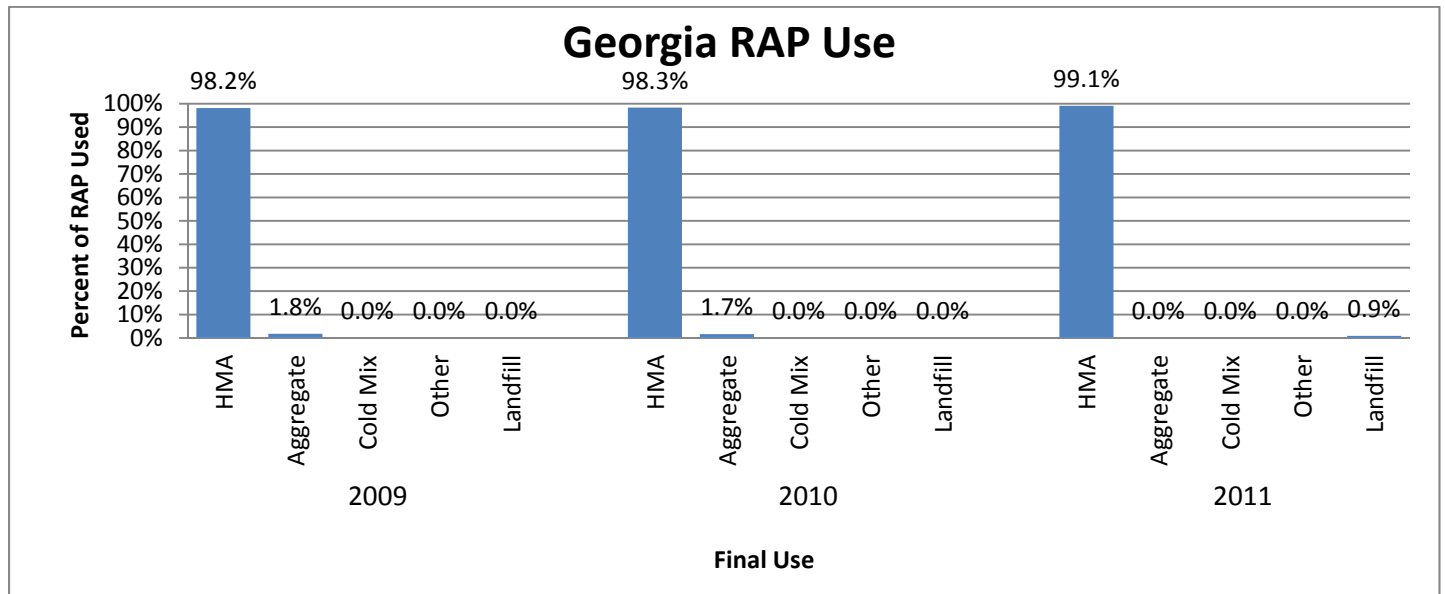
Table B11 summarizes the results received from asphalt mix producers in Georgia. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 2 for 2009 & 2010, 6 for 2011

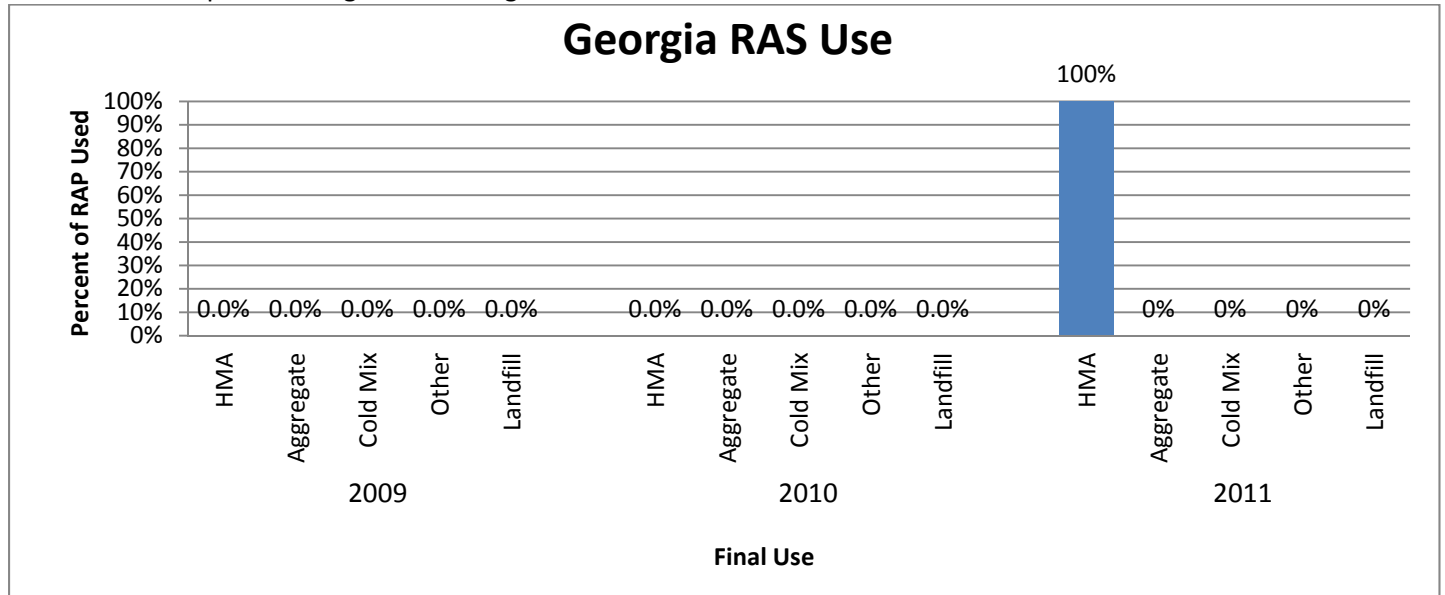


### RAP Use



## RAS Use

No contractor reported using RAS in Georgia in 2009 and 2010.



## WMA Use

No contractors reported using WMA in Georgia in 2009 and 2010.

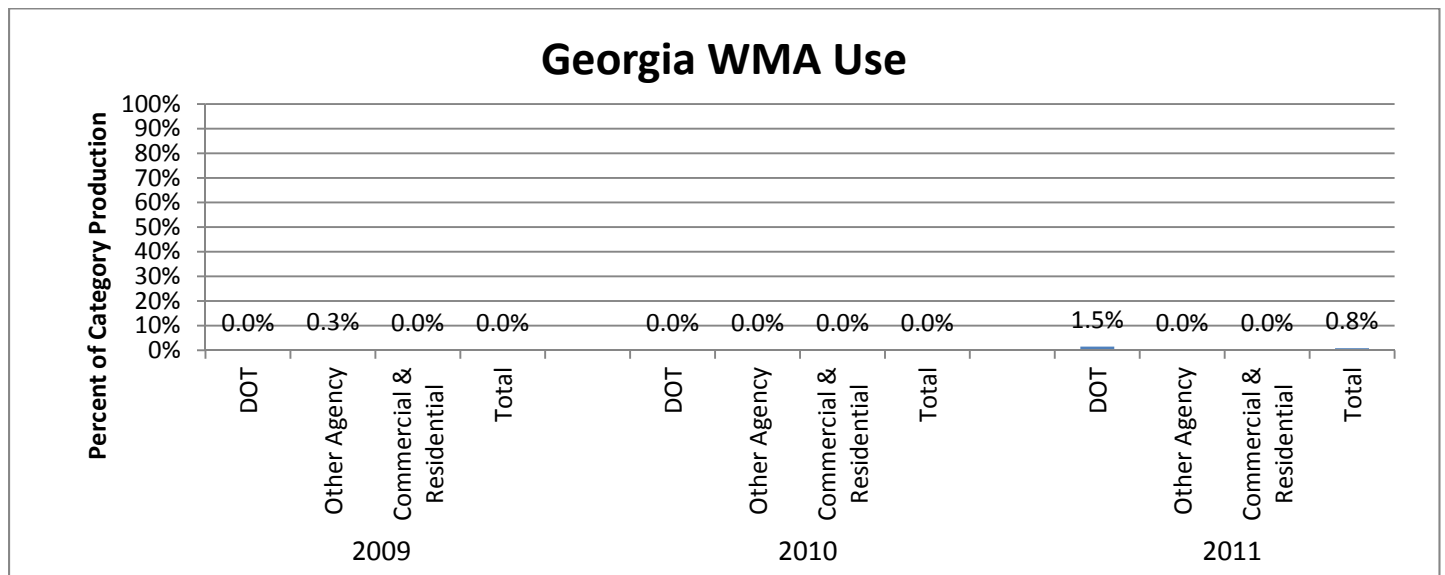


Table B 11: Summary of Georgia Data for 2011

Companies Reporting

6

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	4,078,310	5,315,848
Total Other Agency Tonnage	2,114,921	2,756,681
Total Commercial & Residential Tonnage	1,095,153	1,427,471
Total Tonnage	7,288,384	9,500,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	2,250,218	2,933,033
RAP Tons used in HMA/WMA	1,651,189	2,152,233
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	15,000	19,552
Average % RAP in DOT Mixes	23%	
Average % RAP in Other Agency Mixes	23%	
Average % RAP in Commercial & Residential Mixes	23%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	33%	
RAS Tons Received	305	398
RAS Tons used in HMA/WMA	2,226	2,902
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	2%	
Average % RAS in Other Agency Mixes	3%	
Average % RAS in Commercial & Residential Mixes	3%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	33%	
WMA DOT Tonnage	59,425	77,457
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	-	-
Total WMA Tonnage	59,425	77,457
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	1.0%	
Percent WMA Tons using Plant Foaming	99.0%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tonnage provided by Georgia Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

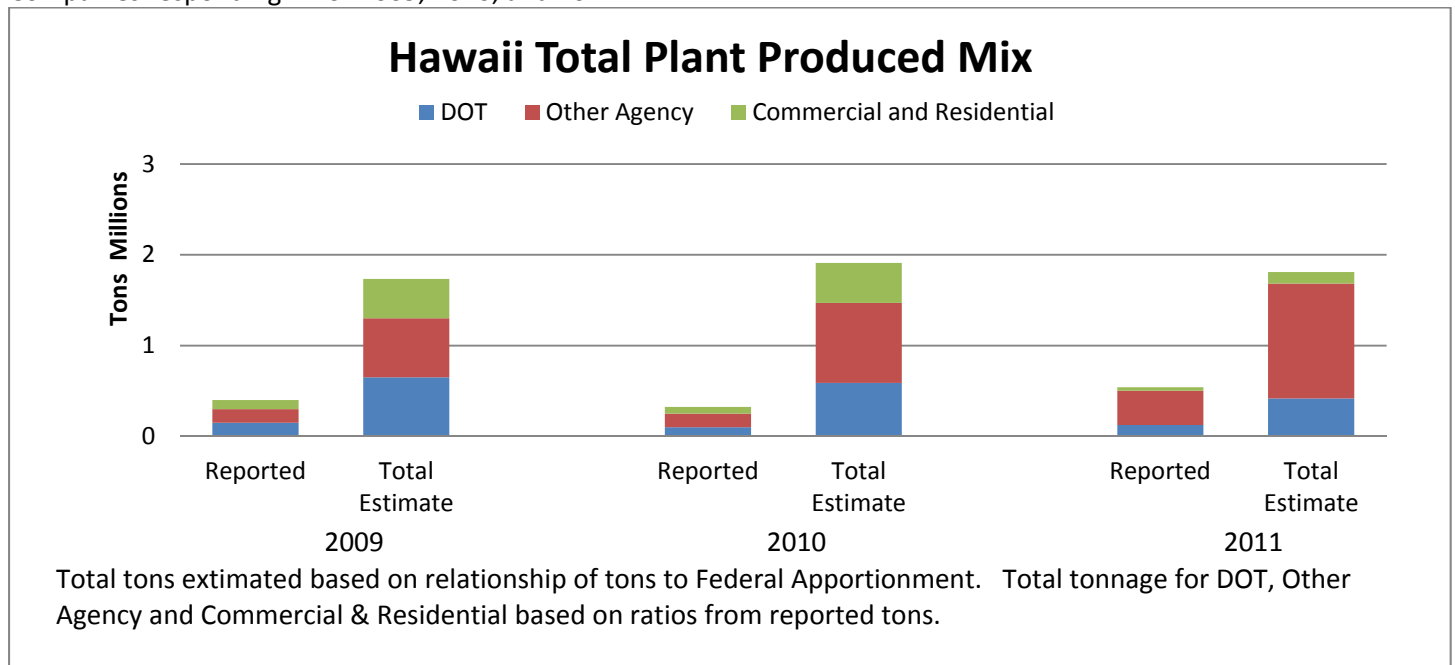


## Hawaii

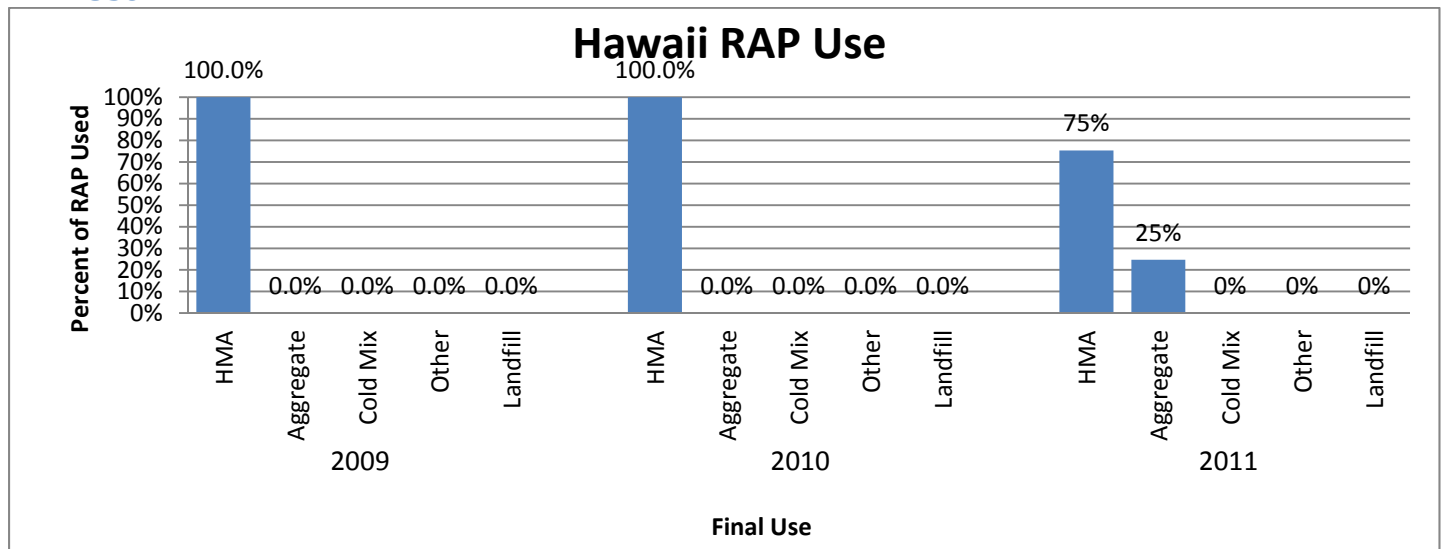
Table B12 summarizes the results received from asphalt mix producers in Hawaii. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 1 for 2009, 2010, and 2011



### RAP Use



### RAS Use

The contractor did not report accepting or using RAS in 2009 and 2010.

## WMA Use

The contractor did not report using WMA in 2009 and 2010.

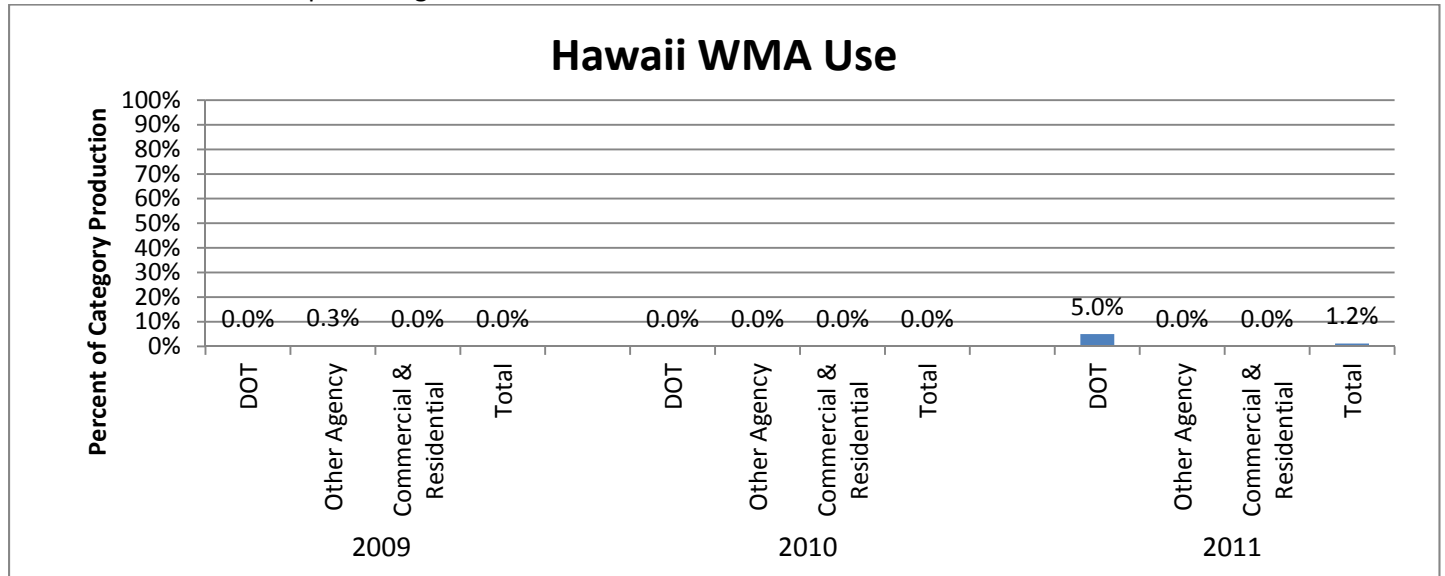


Table B 12: Summary of Hawaii Data for 2011

Companies Reporting

1

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	125,000	418,207
Total Other Agency Tonnage	378,000	1,264,658
Total Commercial & Residential Tonnage	38,000	127,135
Total Tonnage	541,000	1,810,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	129,000	431,590
RAP Tons used in HMA/WMA	58,000	194,048
RAP Tons used as Aggregate	19,000	63,567
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	15%	
Average % RAP in Other Agency Mixes	15%	
Average % RAP in Commercial & Residential Mixes	15%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	6,250	20,910
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	-	-
Total WMA Tonnage	6,250	20,910
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

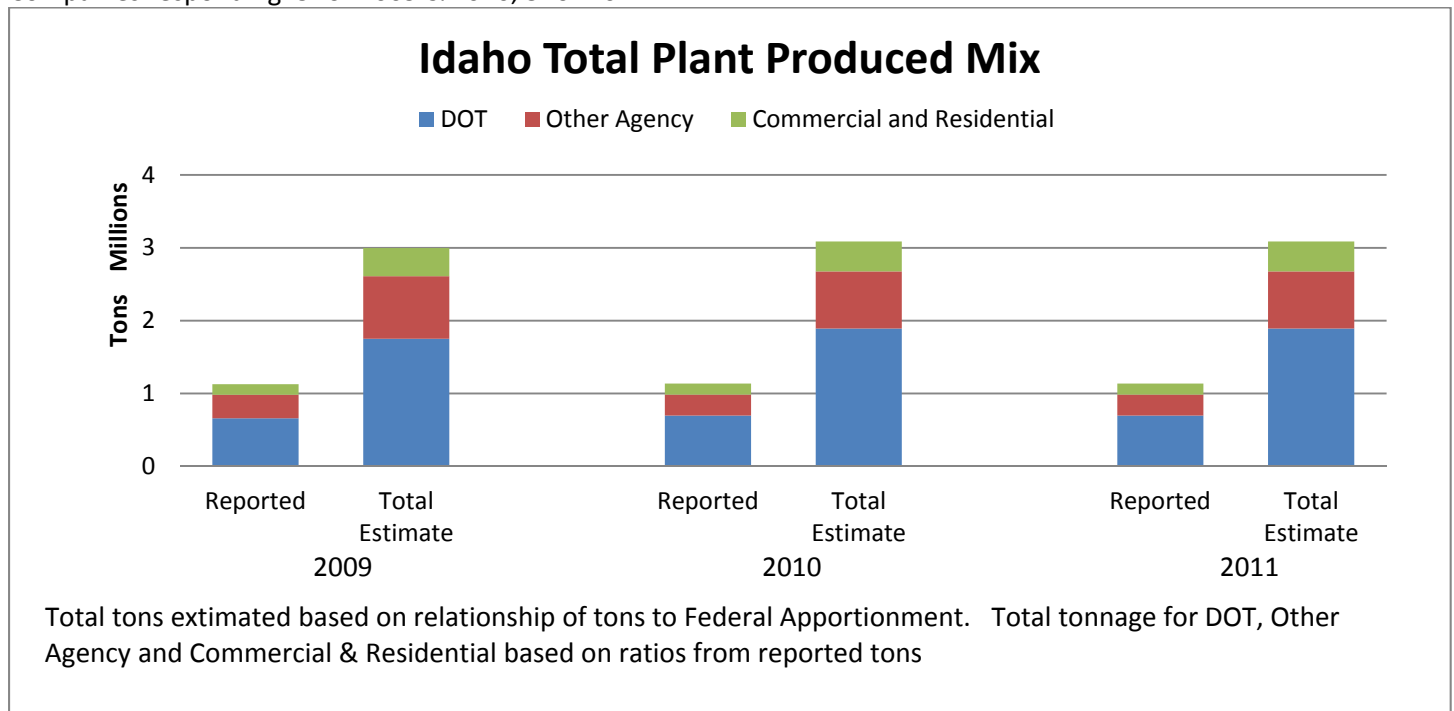
1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Idaho

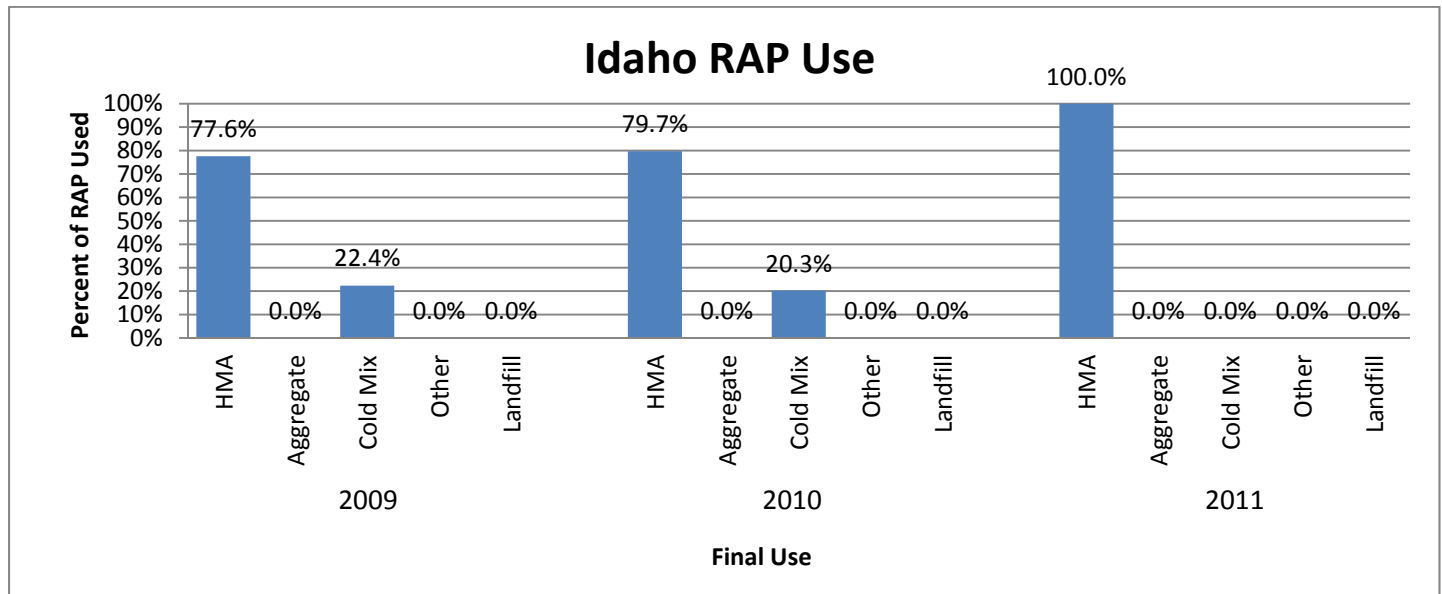
Table B13 summarizes the results received from asphalt mix producers in Idaho. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 5 for 2009 & 2010, 3 for 2011



### RAP Use



### RAS Use

No contractors reported using RAS in 2009, 2010 and 2011.

## WMA Use

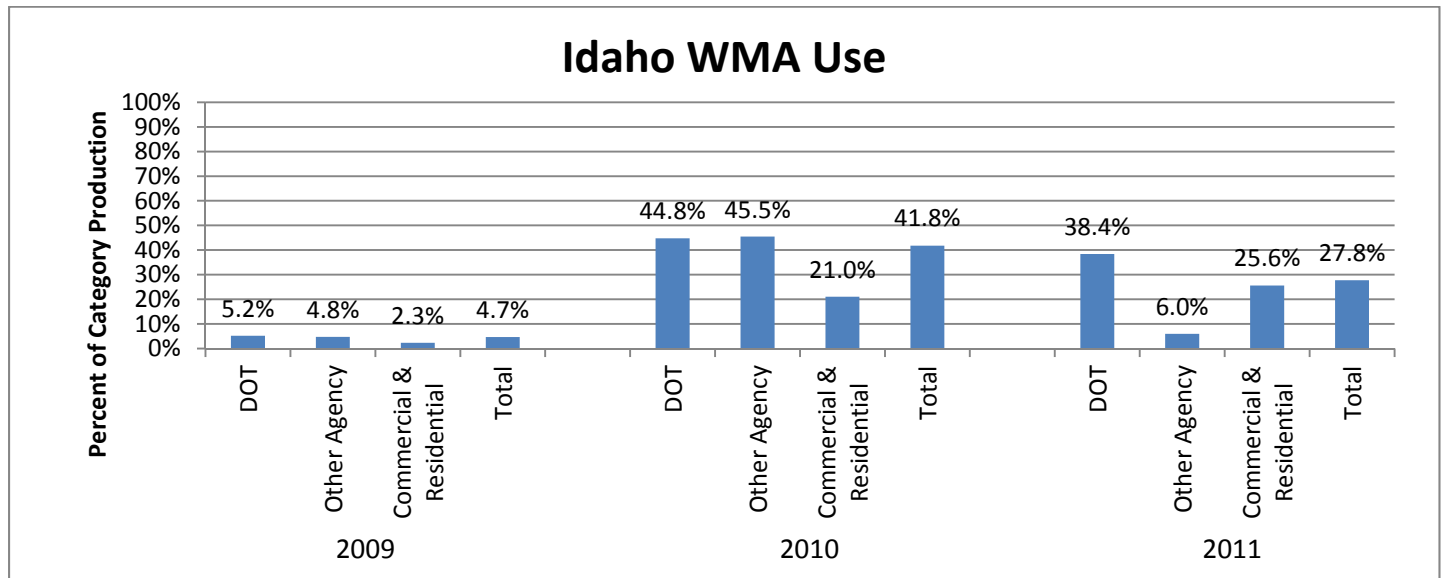


Table B 13: Summary of Idaho Data for 2011

Companies Reporting

3

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	293,200	1,819,031
Total Other Agency Tonnage	130,100	807,149
Total Commercial & Residential Tonnage	133,432	827,820
Total Tonnage	556,732	3,454,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	128,000	794,120
RAP Tons used in HMA/WMA	128,317	796,087
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	23%	
Average % RAP in Other Agency Mixes	21%	
Average % RAP in Commercial & Residential Mixes	24%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	67%	
WMA DOT Tonnage	112,600	698,577
WMA Other Agency Tonnage	7,810	48,454
WMA Commercial & Residential Tonnage	34,124	211,706
Total WMA Tonnage	154,534	958,738
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

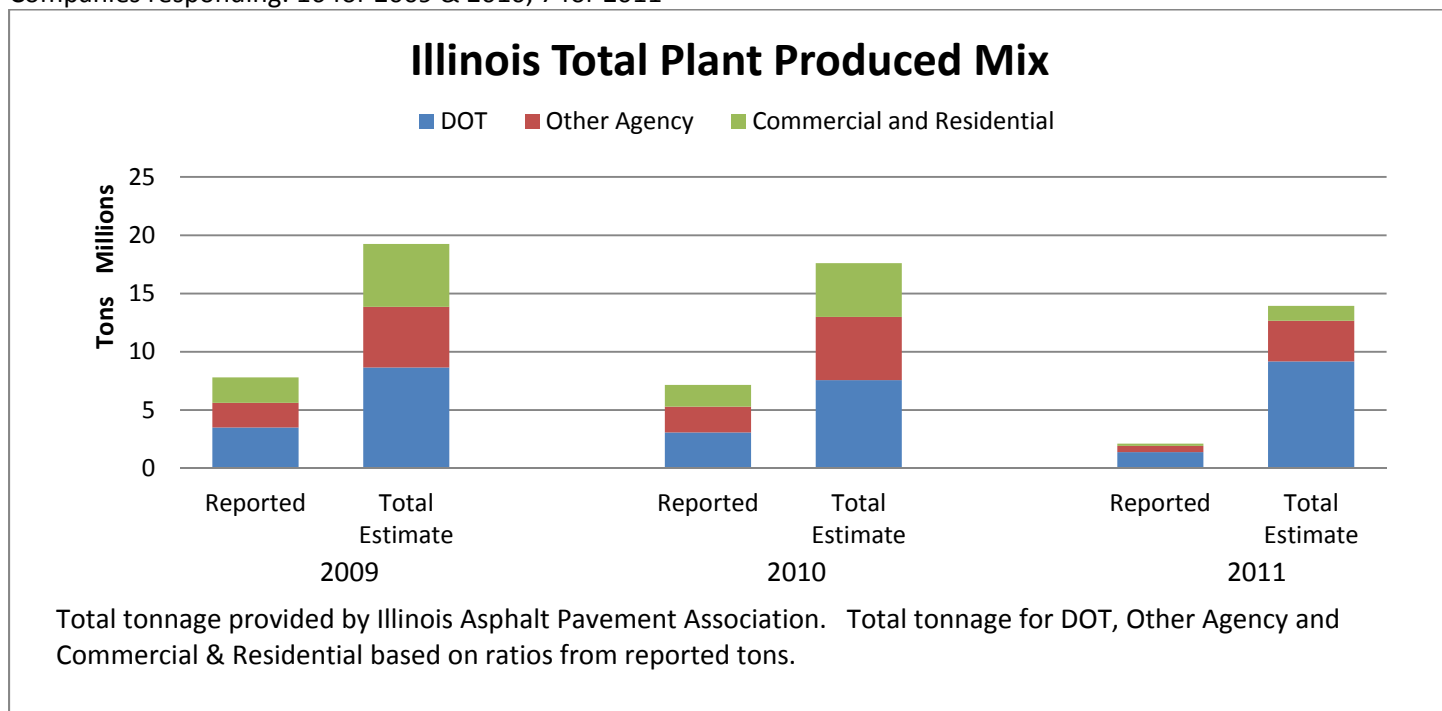
1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Illinois

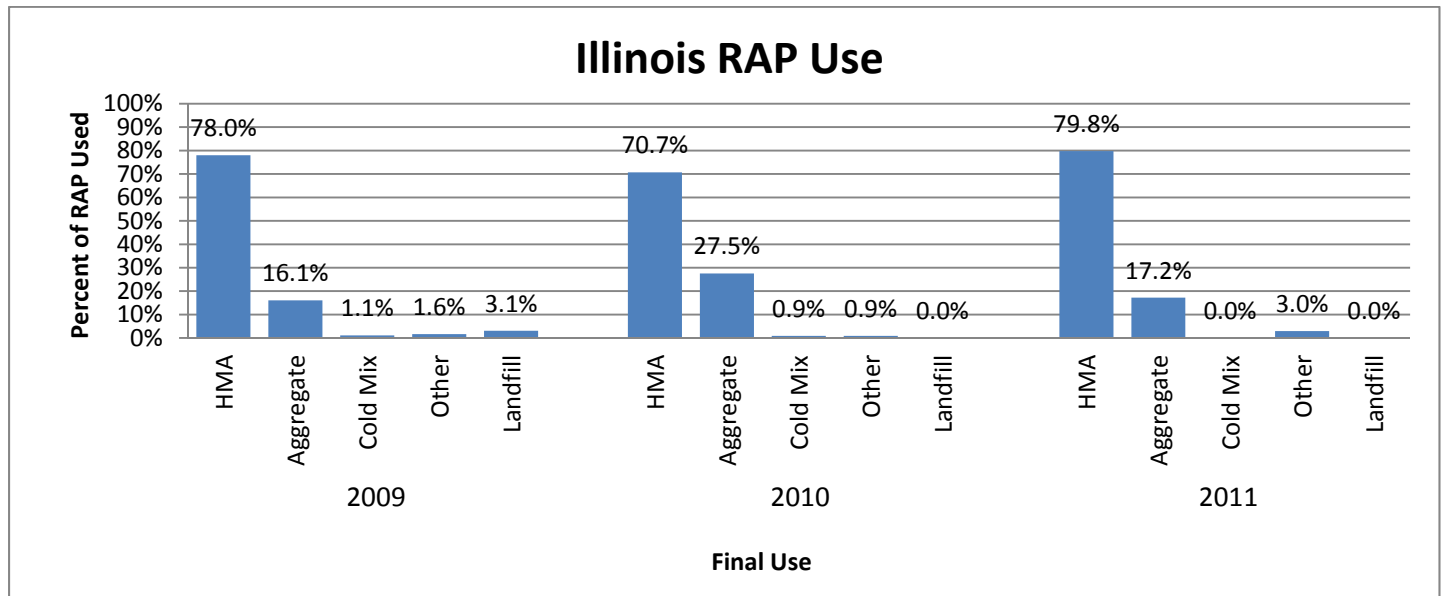
Table B14 summarizes the results received from asphalt mix producers in Illinois. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

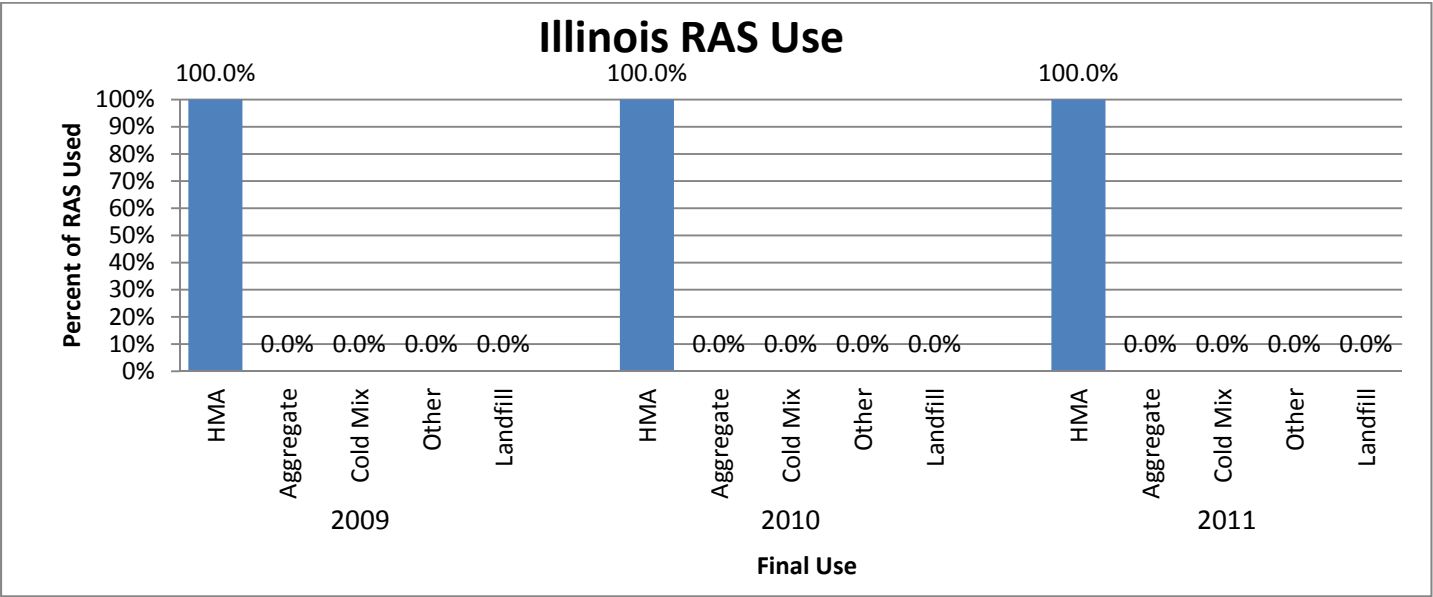
Companies responding: 16 for 2009 & 2010, 7 for 2011



### RAP Use



RAS Use



WMA Use

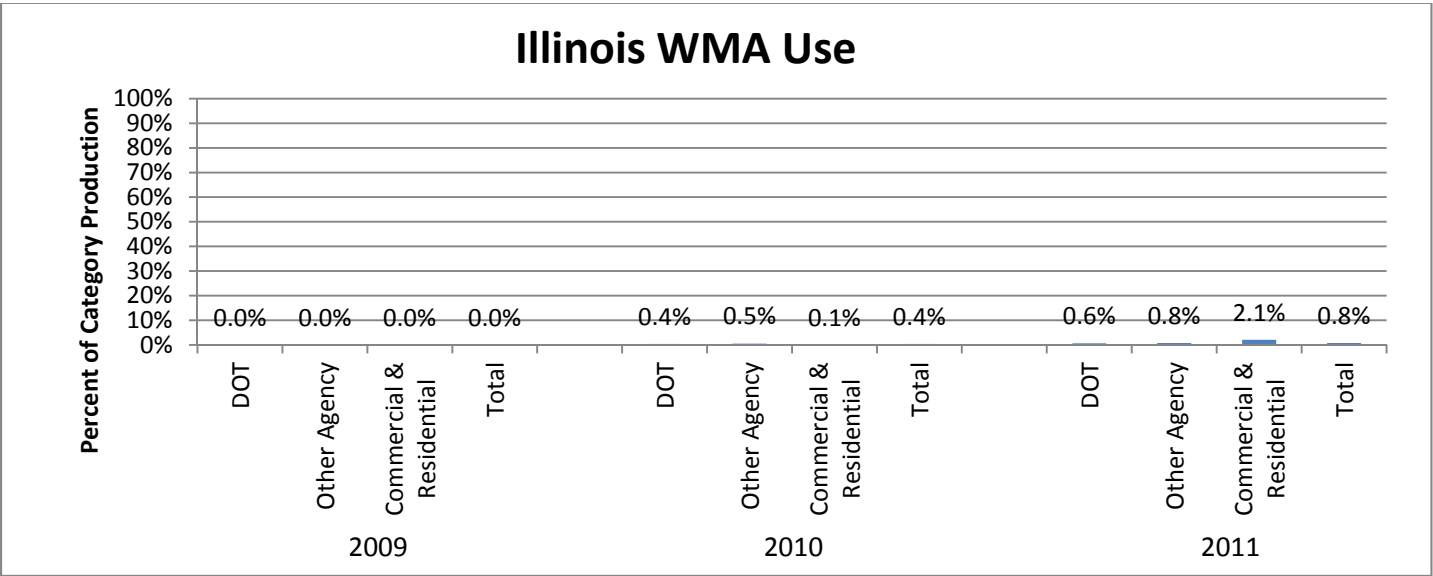




Table B 14: Summary of Illinois Data for 2011

Companies Reporting

7

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,398,000	9,184,004
Total Other Agency Tonnage	529,420	3,477,965
Total Commercial & Residential Tonnage	195,000	1,281,031
Total Tonnage	2,122,420	13,943,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	644,835	4,236,171
RAP Tons used in HMA/WMA	335,900	2,206,657
RAP Tons used as Aggregate	72,500	476,281
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	12,500	82,117
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	12%	
Average % RAP in Other Agency Mixes	22%	
Average % RAP in Commercial & Residential Mixes	26%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	29%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	2,700	17,737
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	3%	
Average % RAS in Other Agency Mixes	1%	
Average % RAS in Commercial & Residential Mixes	1%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	57%	
WMA DOT Tonnage	8,750	57,482
WMA Other Agency Tonnage	4,020	26,409
WMA Commercial & Residential Tonnage	4,050	26,606
Total WMA Tonnage	16,820	110,497
Percent WMA Tons using Chemical Additives	16.5%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	83.5%	
Percent WMA Tons using Organic Additive	0.0%	

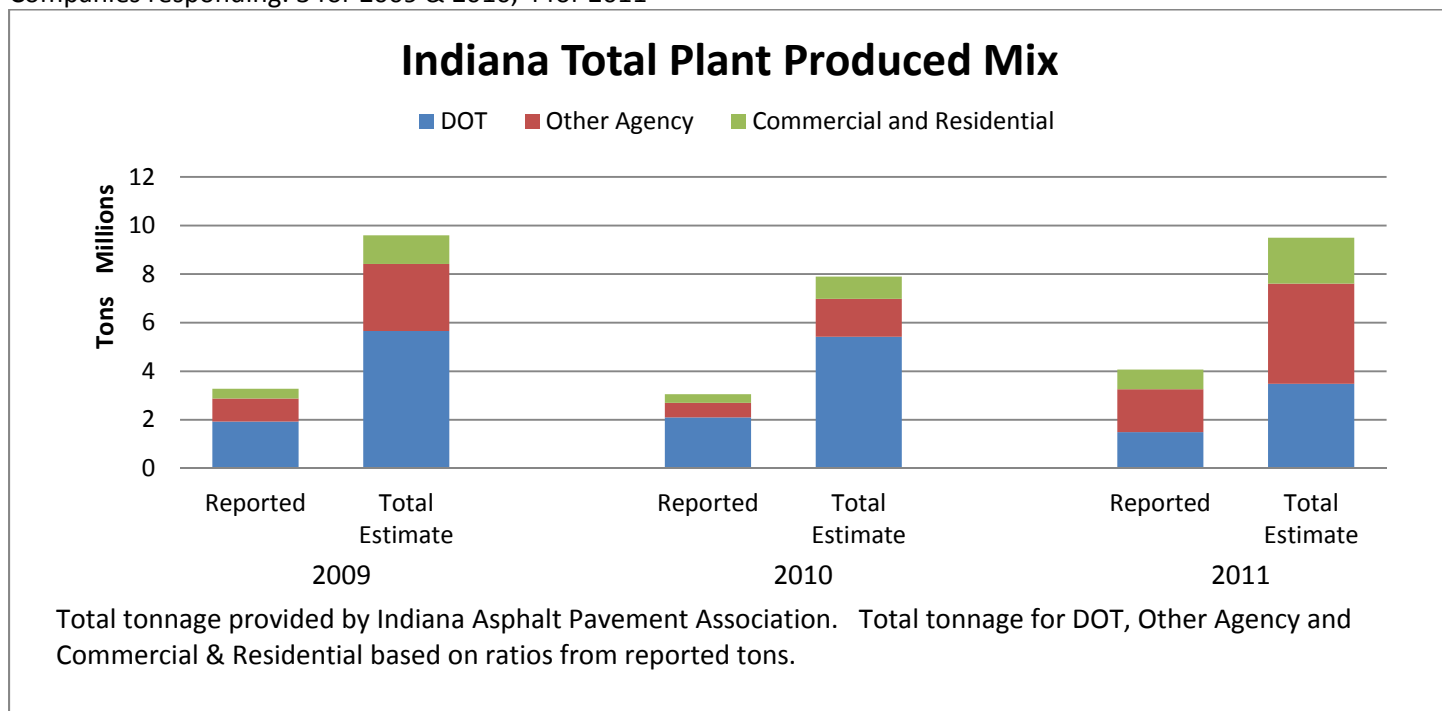
1. Total tonnage provided by Illinois Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Indiana

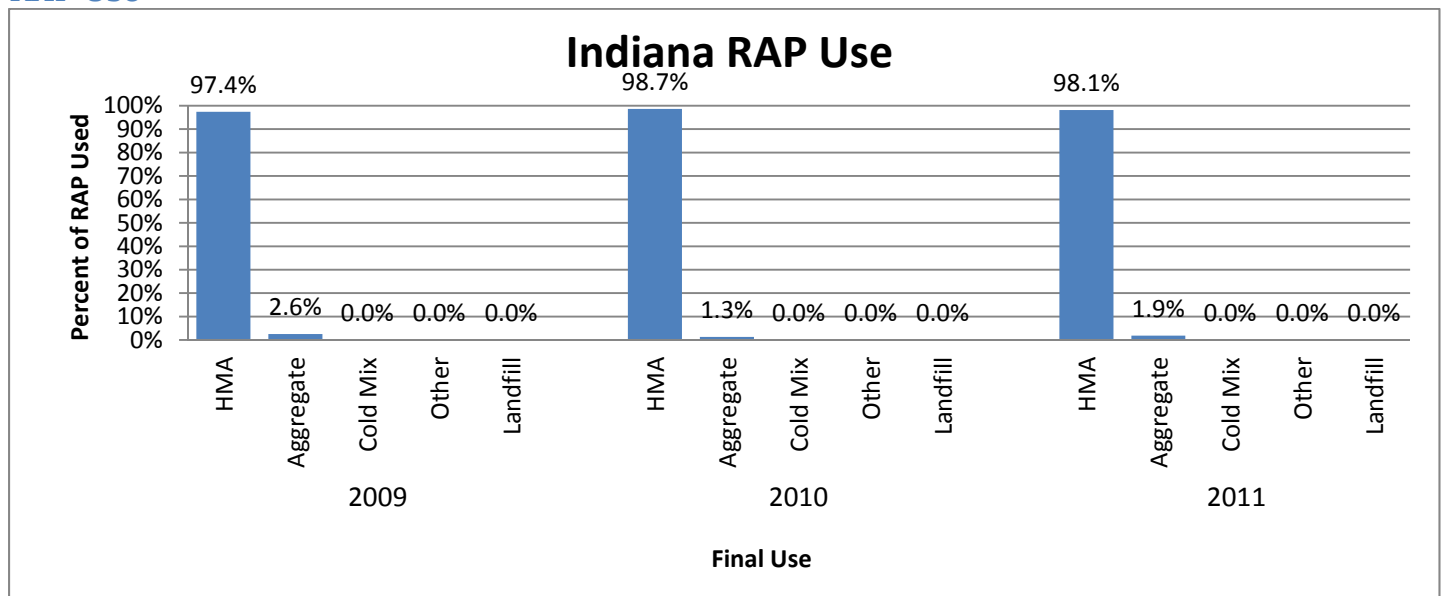
Table B15 summarizes the results received from asphalt mix producers in Indiana. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

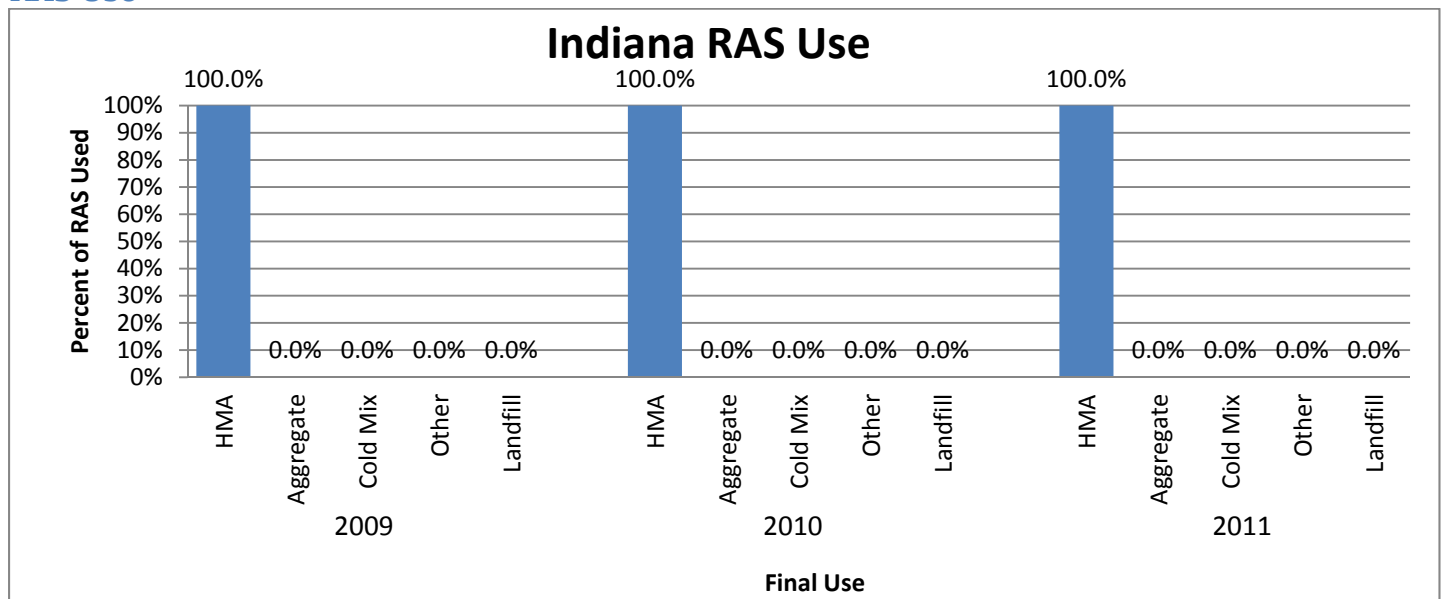
Companies responding: 3 for 2009 & 2010, 4 for 2011



### RAP Use



## RAS Use



## WMA Use

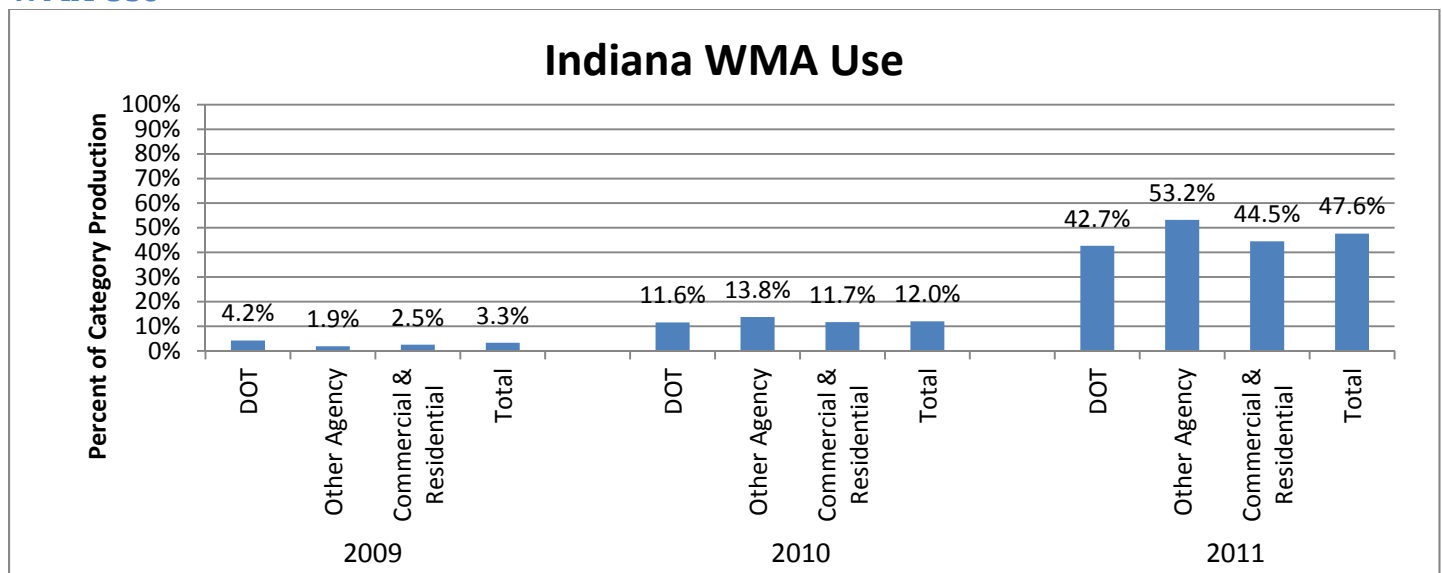


Table B 14: Summary of Indiana Data for 2011

Companies Reporting

4

HMA/WMA		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,494,680	3,486,360
Total Other Agency Tonnage	1,766,269	4,119,845
Total Commercial & Residential Tonnage	811,912	1,893,795
Total Tonnage	4,072,861	9,500,000
Reclaimed Asphalt Pavement (RAP)		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	1,022,840	2,385,787
RAP Tons used in HMA/WMA	1,050,895	2,451,226
RAP Tons used as Aggregate	20,000	46,650
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	26%	
Average % RAP in Other Agency Mixes	30%	
Average % RAP in Commercial & Residential Mixes	29%	
Reclaimed Asphalt Shingles (RAS)		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	100%	
RAS Tons Received	18,900	44,084
RAS Tons used in HMA/WMA	23,000	53,648
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	2%	
Average % RAS in Other Agency Mixes	1%	
Average % RAS in Commercial & Residential Mixes	2%	
Warm-Mix Asphalt		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	637,738	1,487,532
WMA Other Agency Tonnage	939,615	2,191,664
WMA Commercial & Residential Tonnage	361,530	843,272
Total WMA Tonnage	1,938,883	4,522,469
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

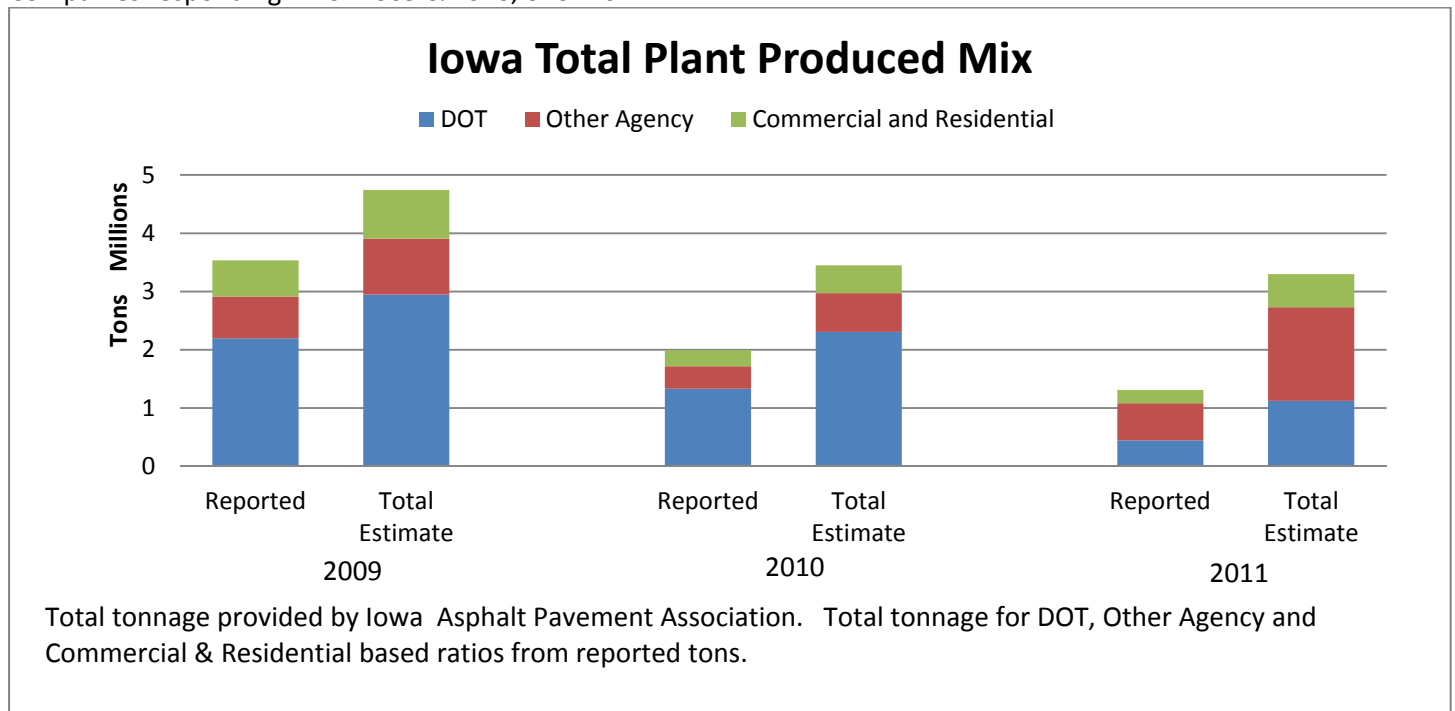
1. Total tonnage provided by Indiana Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Iowa

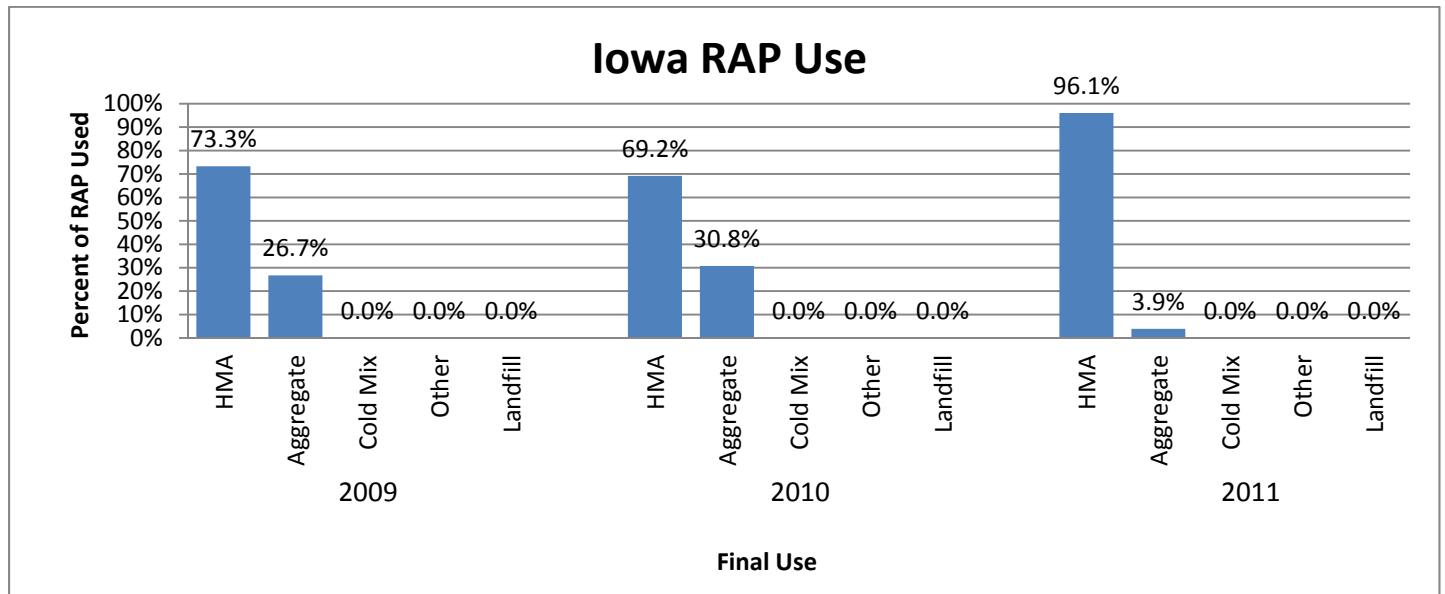
Table B16 summarizes the results received from asphalt mix producers in Iowa. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

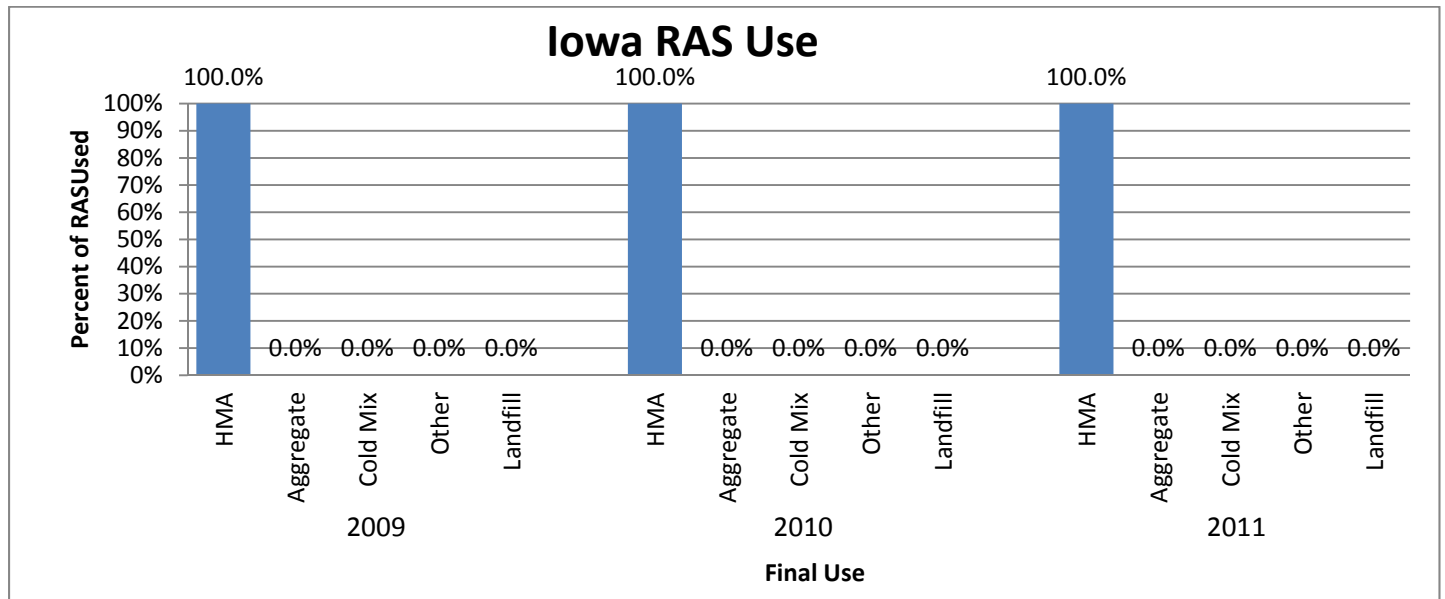
Companies responding: 7 for 2009 & 2010, 6 for 2011



### RAP Use



## RAS Use



## WMA Use

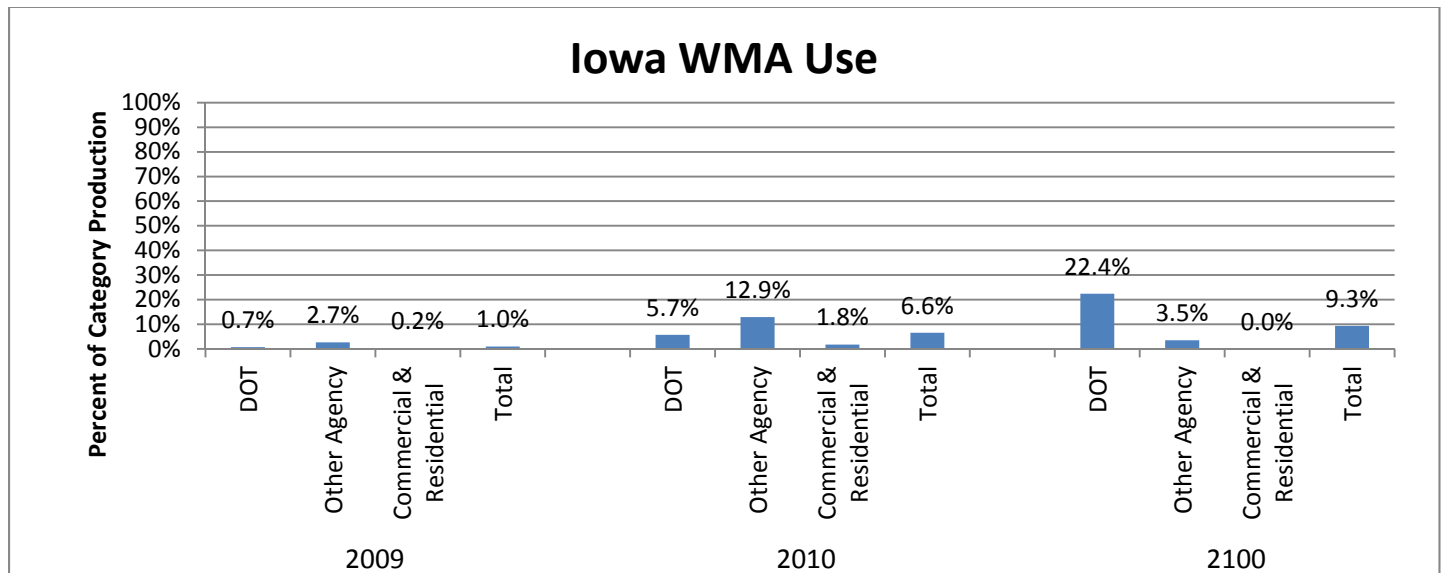


Table B 15: Summary of Iowa Data for 2011

Companies Reporting

6

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	446,903	1,124,969
Total Other Agency Tonnage	637,485	1,604,712
Total Commercial & Residential Tonnage	226,564	570,319
Total Tonnage	1,310,952	3,300,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	234,705	590,812
RAP Tons used in HMA/WMA	182,903	460,415
RAP Tons used as Aggregate	7,500	18,879
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	14%	
Average % RAP in Other Agency Mixes	17%	
Average % RAP in Commercial & Residential Mixes	19%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	67%	
RAS Tons Received	8,753	22,034
RAS Tons used in HMA/WMA	6,538	16,457
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	1%	
Average % RAS in Other Agency Mixes	1%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	33%	
WMA DOT Tonnage	100,000	251,725
WMA Other Agency Tonnage	22,264	56,044
WMA Commercial & Residential Tonnage	-	-
Total WMA Tonnage	122,264	307,770
Percent WMA Tons using Chemical Additives	81.8%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	18.2%	
Percent WMA Tons using Organic Additive	0.0%	

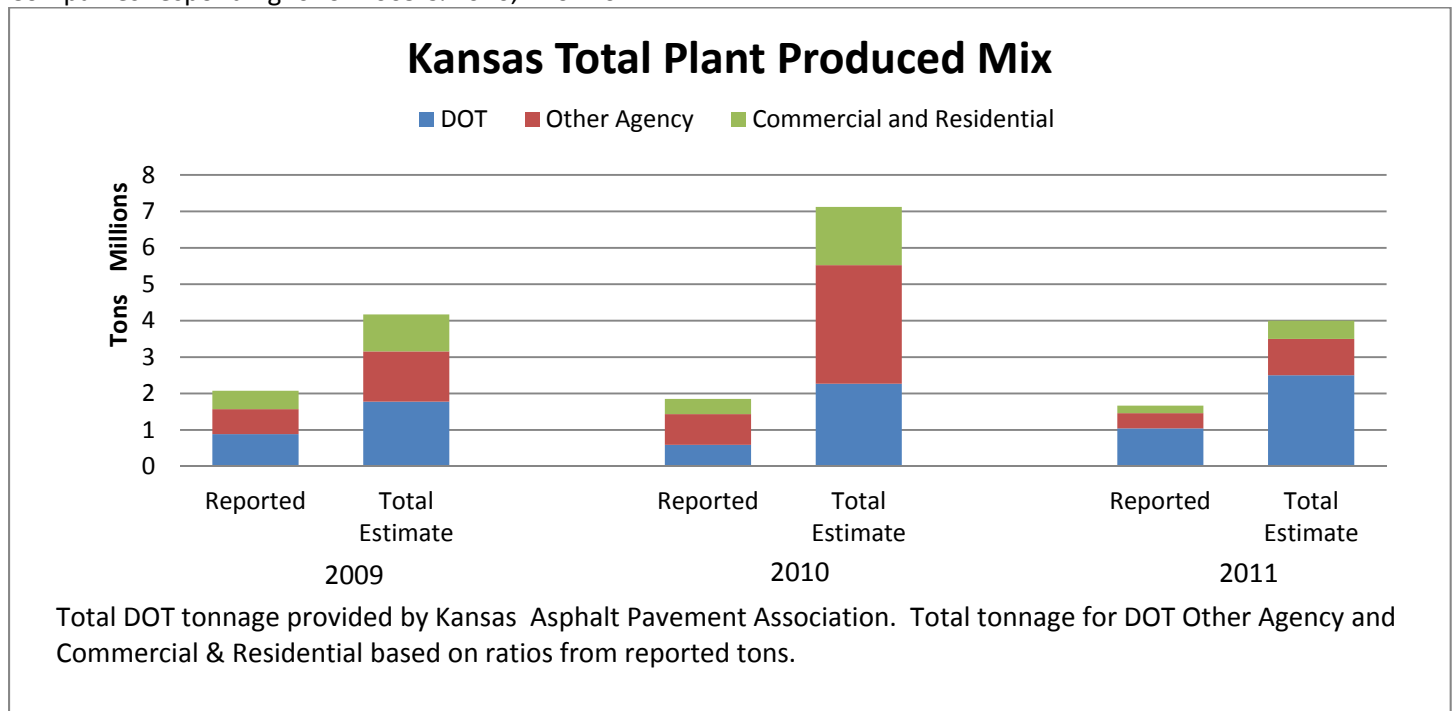
1. Total tonnage provided by Iowa Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Kansas

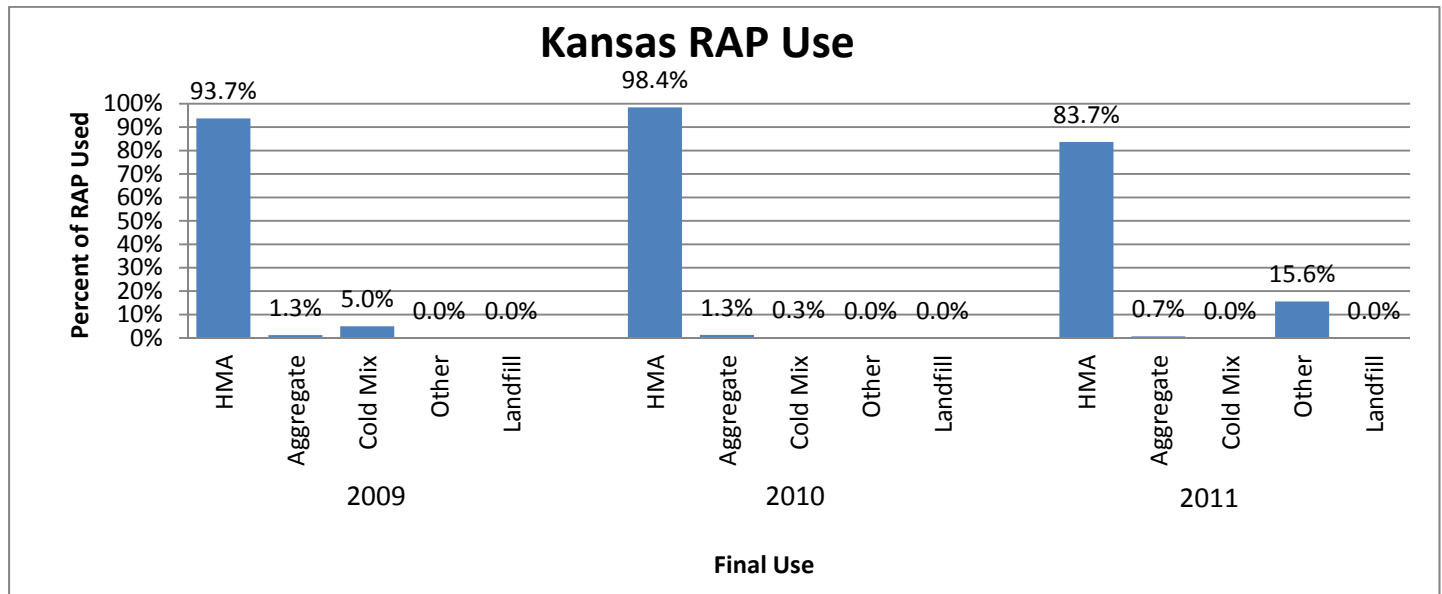
Table B17 summarizes the results received from asphalt mix producers in Kansas. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 6 for 2009 & 2010, 4 for 2011

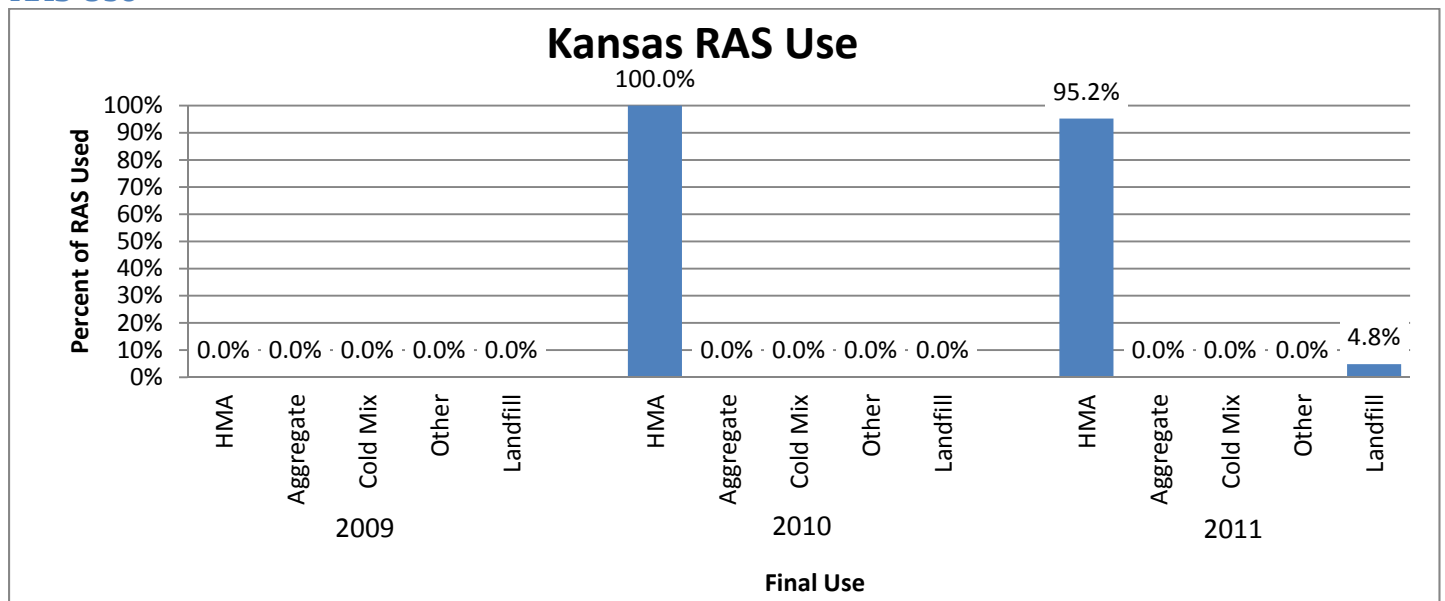


### RAP Use





## RAS Use



## WMA Use

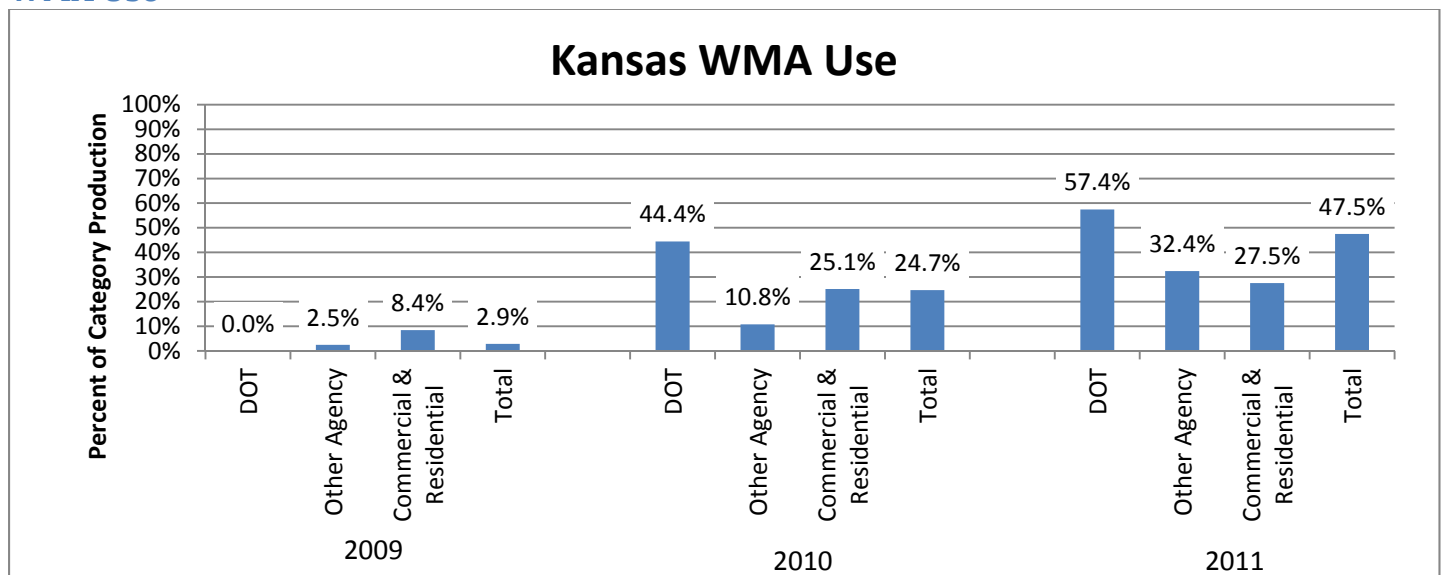


Table B 16: Summary of Kansas Data for 2011

Companies Reporting

4

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,043,628	2,502,638
Total Other Agency Tonnage	416,291	998,273
Total Commercial & Residential Tonnage	208,126	499,090
Total Tonnage	1,668,045	4,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	401,089	961,818
RAP Tons used in HMA/WMA	326,905	783,924
RAP Tons used as Aggregate	2,757	6,611
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	61,039	146,373
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	19%	
Average % RAP in Other Agency Mixes	16%	
Average % RAP in Commercial & Residential Mixes	23%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	100%	
RAS Tons Received	21,284	51,039
RAS Tons used in HMA/WMA	1,805	4,329
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	91	218
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	1%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	599,550	1,437,731
WMA Other Agency Tonnage	134,838	323,343
WMA Commercial & Residential Tonnage	57,328	137,473
Total WMA Tonnage	791,716	1,898,547
Percent WMA Tons using Chemical Additives	7.9%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	92.1%	
Percent WMA Tons using Organic Additive	0.0%	

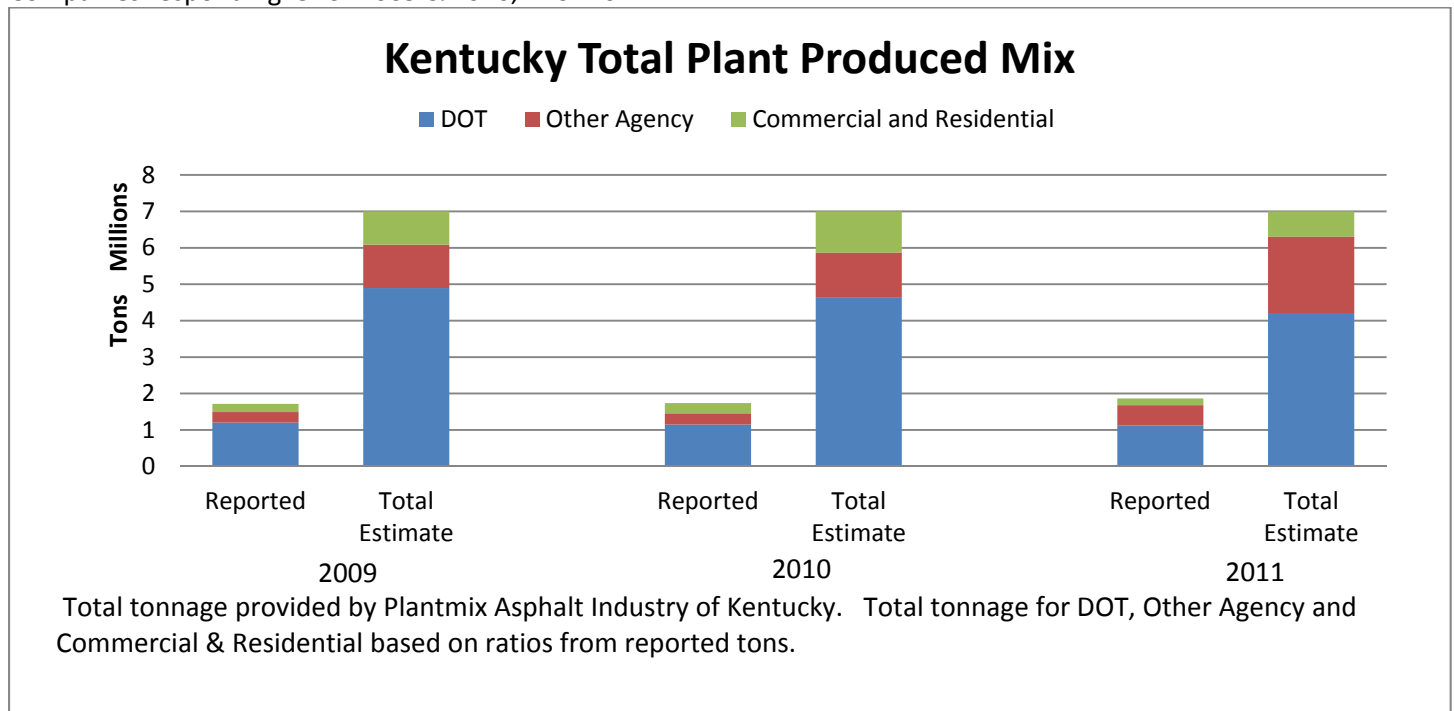
1. Total tonnage provided by Kansas Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Kentucky

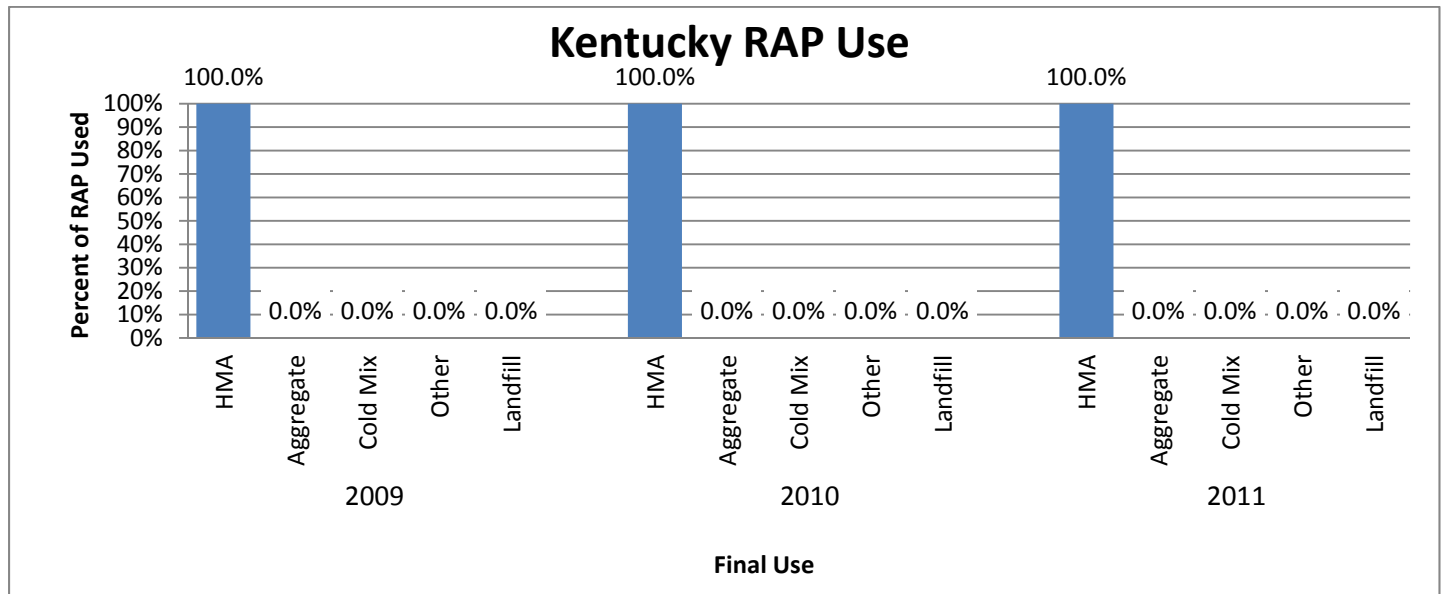
Table B18 summarizes the results received from asphalt mix producers in Kentucky. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

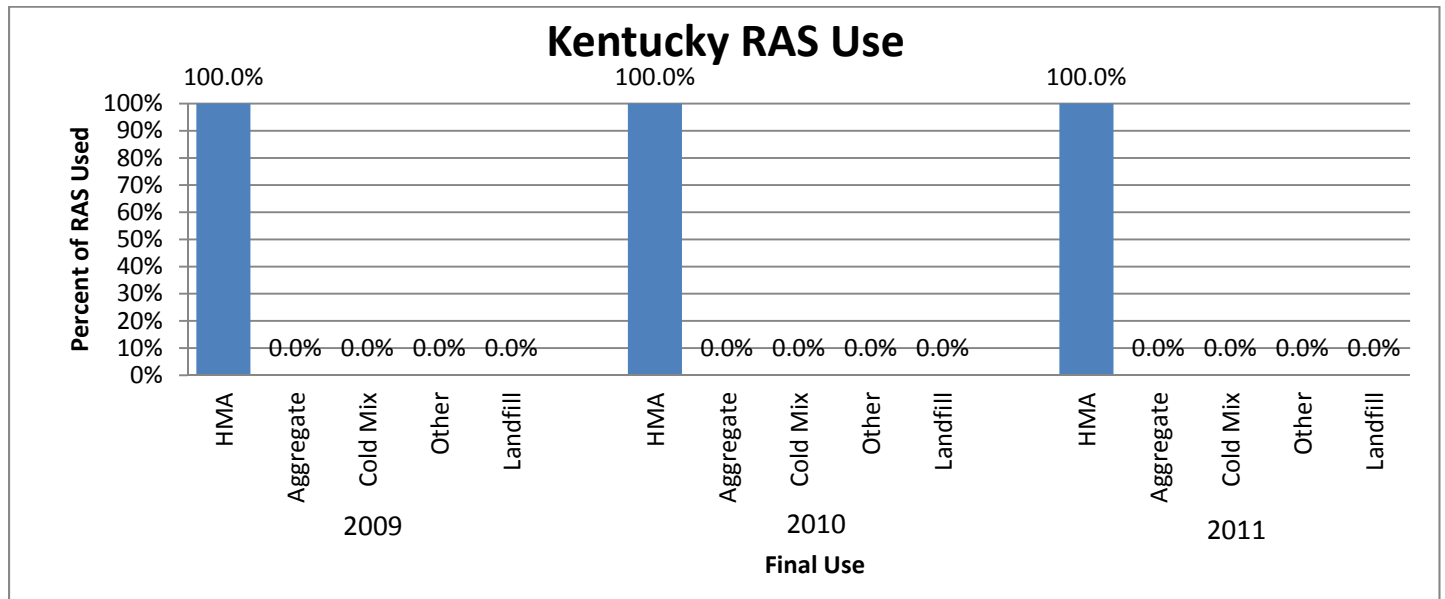
Companies responding: 3 for 2009 & 2010, 4 for 2011



### RAP Use



## RAS Use



## WMA Use

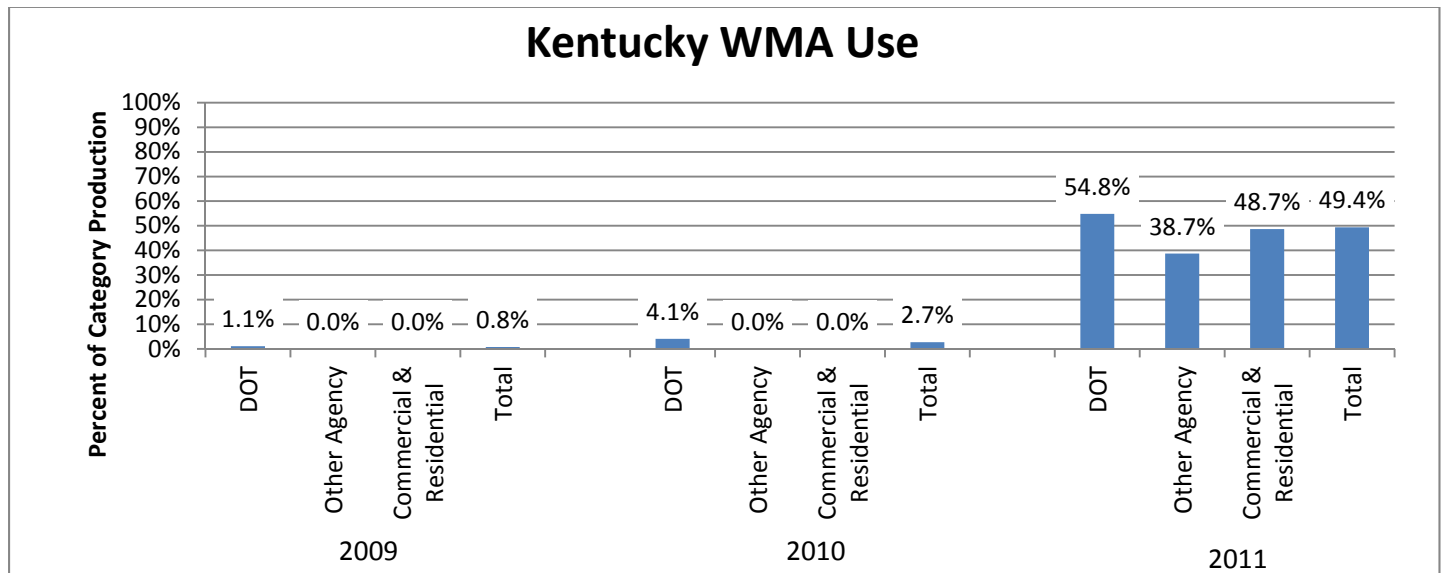


Table B 17: Summary of Kentucky Data for 2011

Companies Reporting

4

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,121,786	4,212,092
Total Other Agency Tonnage	559,276	2,099,974
Total Commercial & Residential Tonnage	183,214	687,934
Total Tonnage	1,864,276	7,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	146,114	548,630
RAP Tons used in HMA/WMA	167,582	629,237
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	32%	
Average % RAP in Other Agency Mixes	12%	
Average % RAP in Commercial & Residential Mixes	11%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	25%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	10	38
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	3%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	615,168	2,309,836
WMA Other Agency Tonnage	216,442	812,699
WMA Commercial & Residential Tonnage	89,169	334,814
Total WMA Tonnage	920,779	3,457,349
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

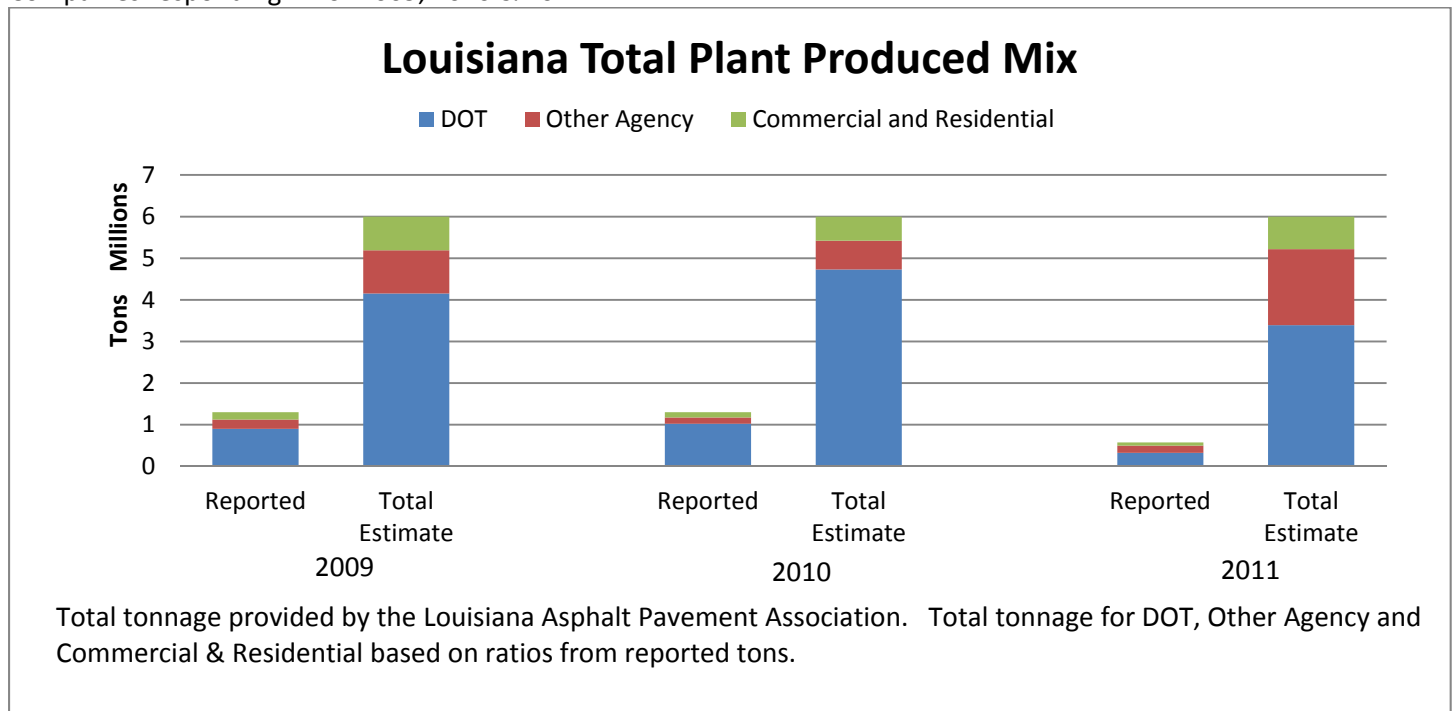
1. Total tonnage provided by Plantmix Asphalt Industry of Kentucky. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Louisiana

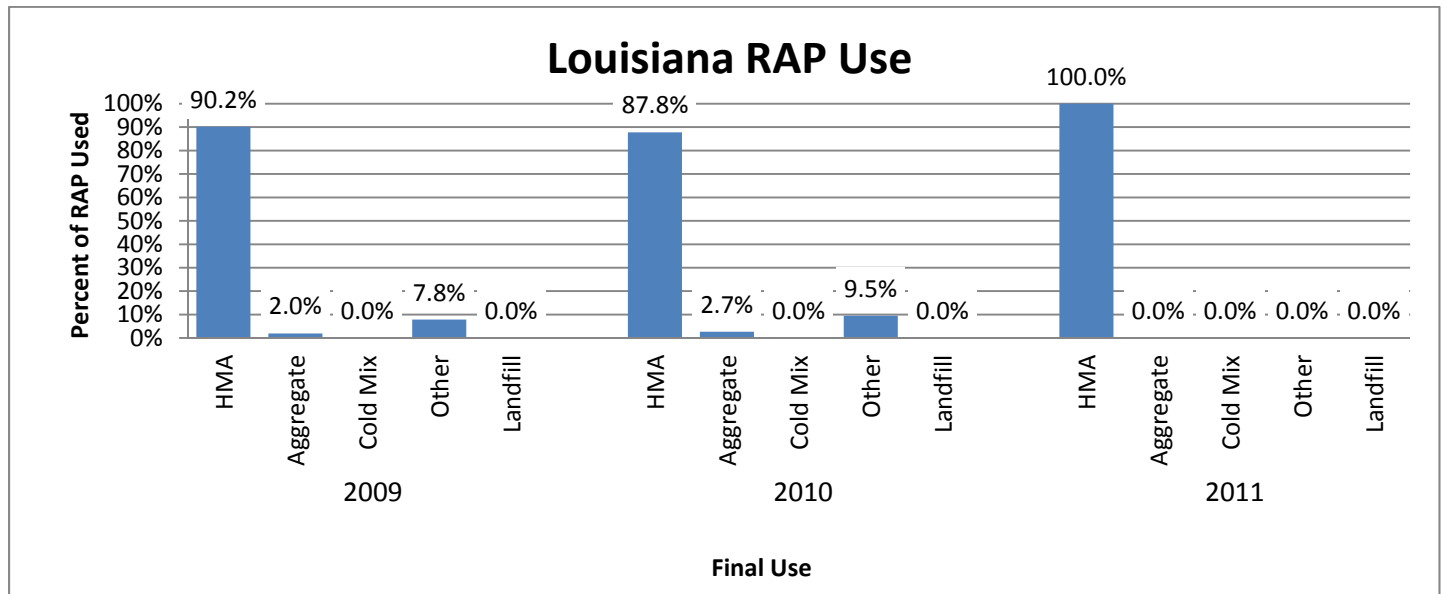
Table B19 summarizes the results received from asphalt mix producers in Louisiana. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 2 for 2009, 2010 & 2011



### RAP Use



### RAS Use

No contractors reported using RAS in 2009, 2010 or 2011.

## WMA Use

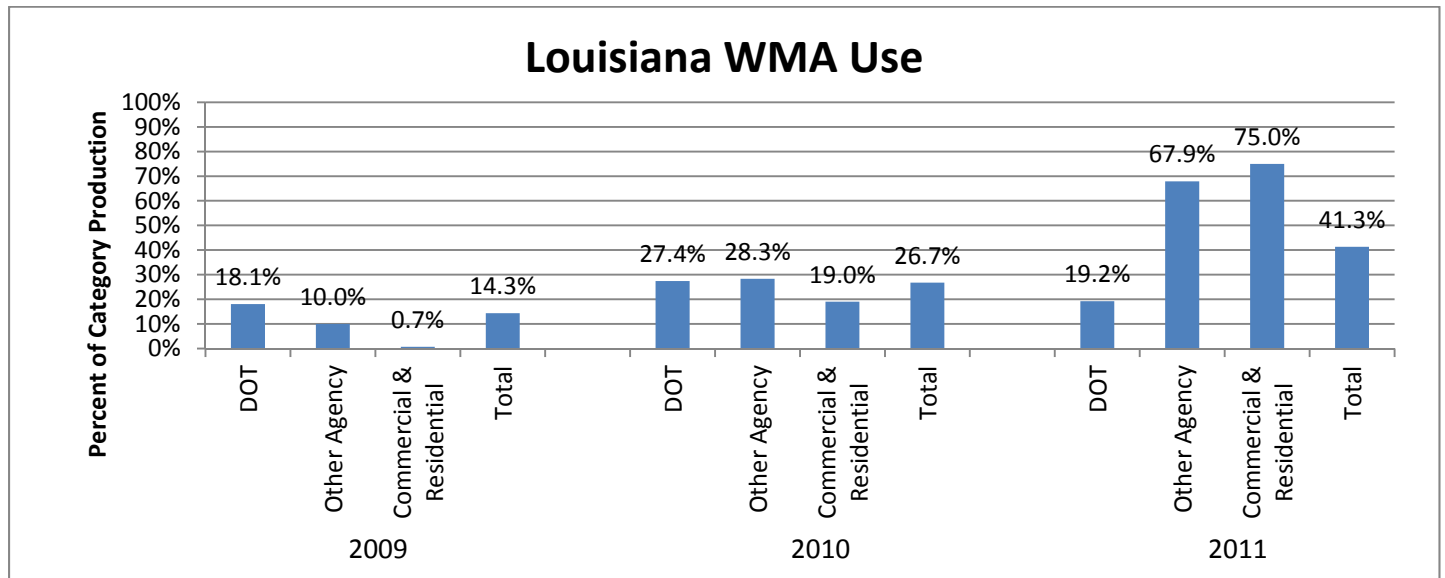


Table B 18: Summary of Louisiana Data for 2011

Companies Reporting

2

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	325,000	3,391,304
Total Other Agency Tonnage	175,000	1,826,087
Total Commercial & Residential Tonnage	75,000	782,609
Total Tonnage	575,000	6,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	110,000	1,147,826
RAP Tons used in HMA/WMA	106,250	1,108,696
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	24%	
Average % RAP in Other Agency Mixes	22%	
Average % RAP in Commercial & Residential Mixes	13%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	62,500	652,174
WMA Other Agency Tonnage	118,750	1,239,130
WMA Commercial & Residential Tonnage	56,250	586,957
Total WMA Tonnage	237,500	2,478,261
Percent WMA Tons using Chemical Additives	3.7%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	96.3%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tonnage provided by the Louisiana Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

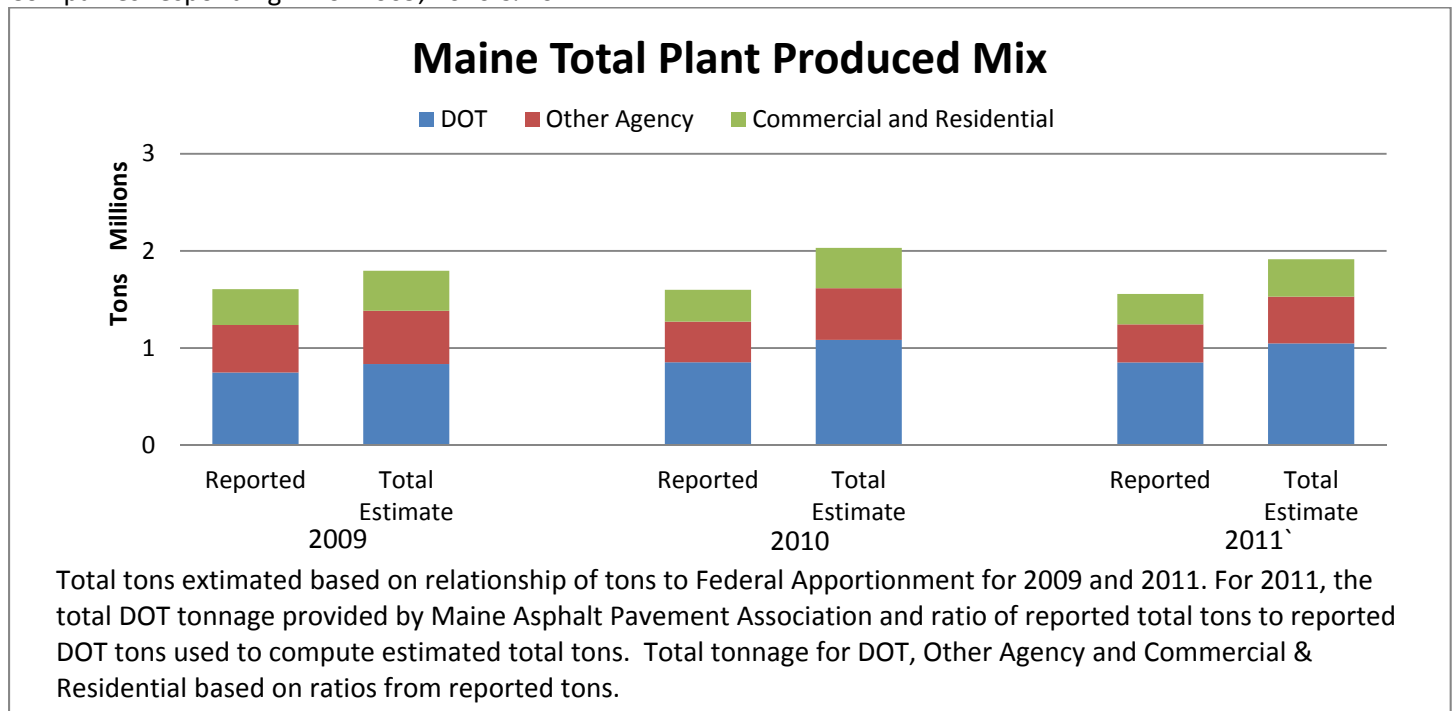


## Maine

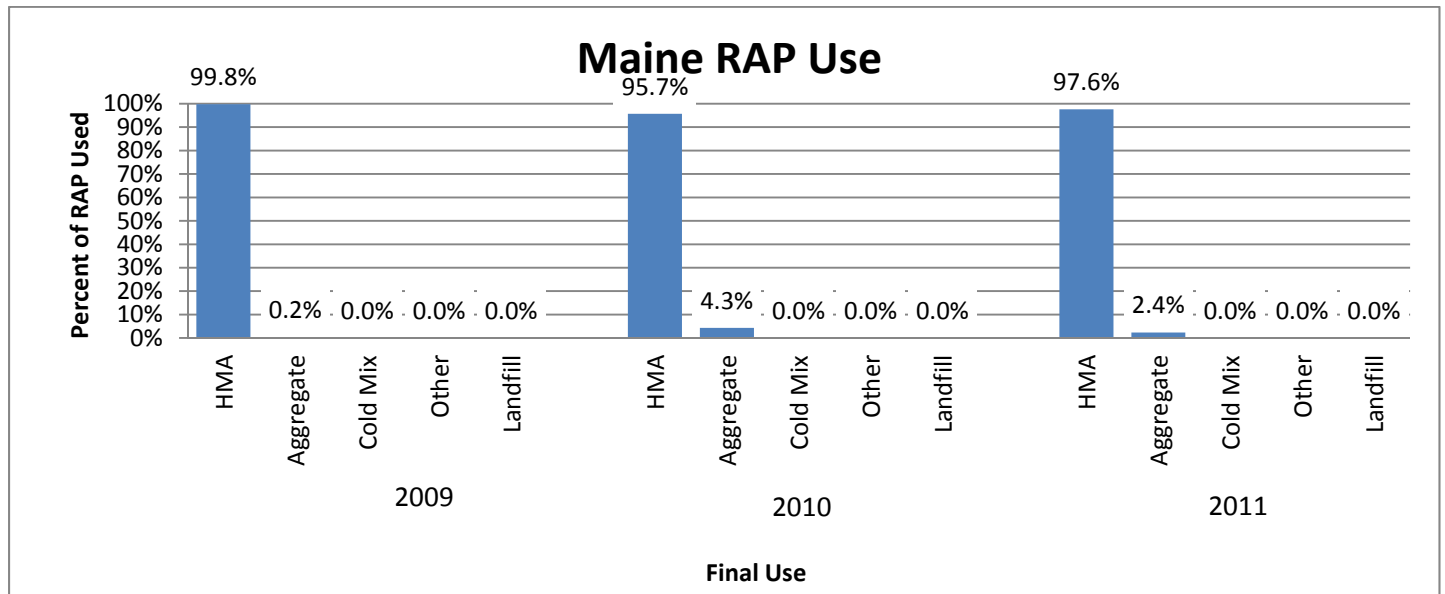
Table B20 summarizes the results received from asphalt mix producers in Maine. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 2 for 2009, 2010 & 2011

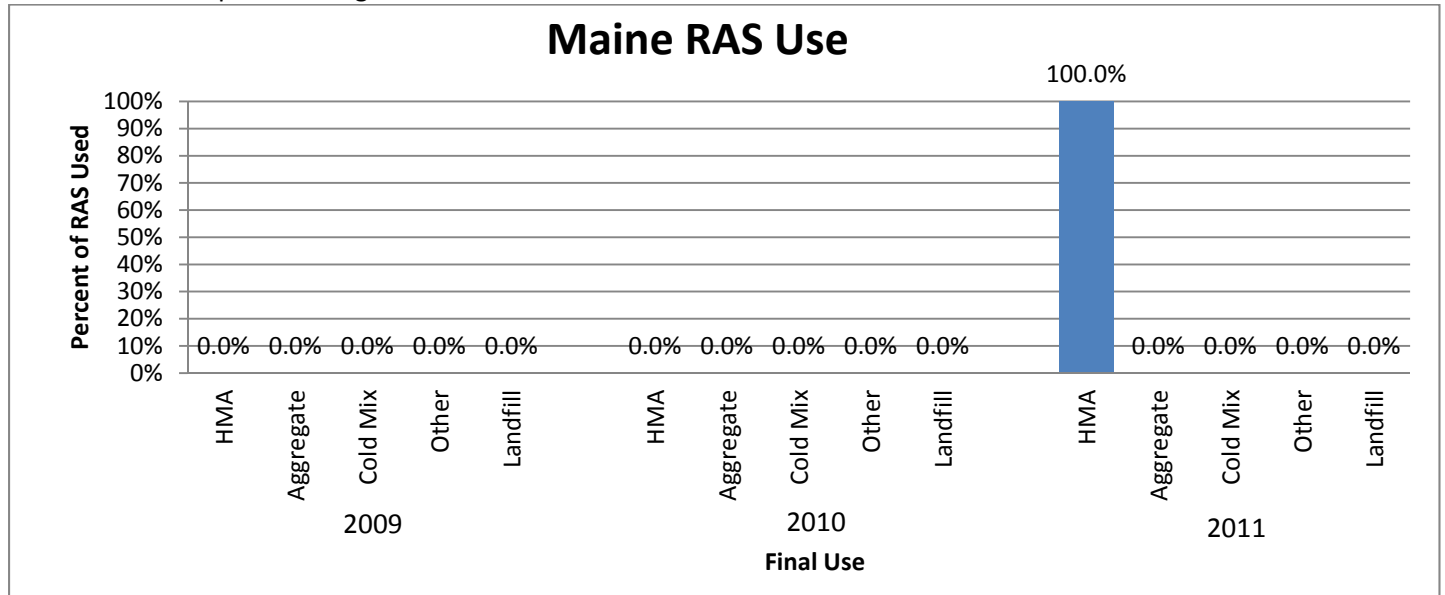


### RAP Use



## RAS Use

No contractors reported using RAS in 2009 and 2010.



## WMA Use

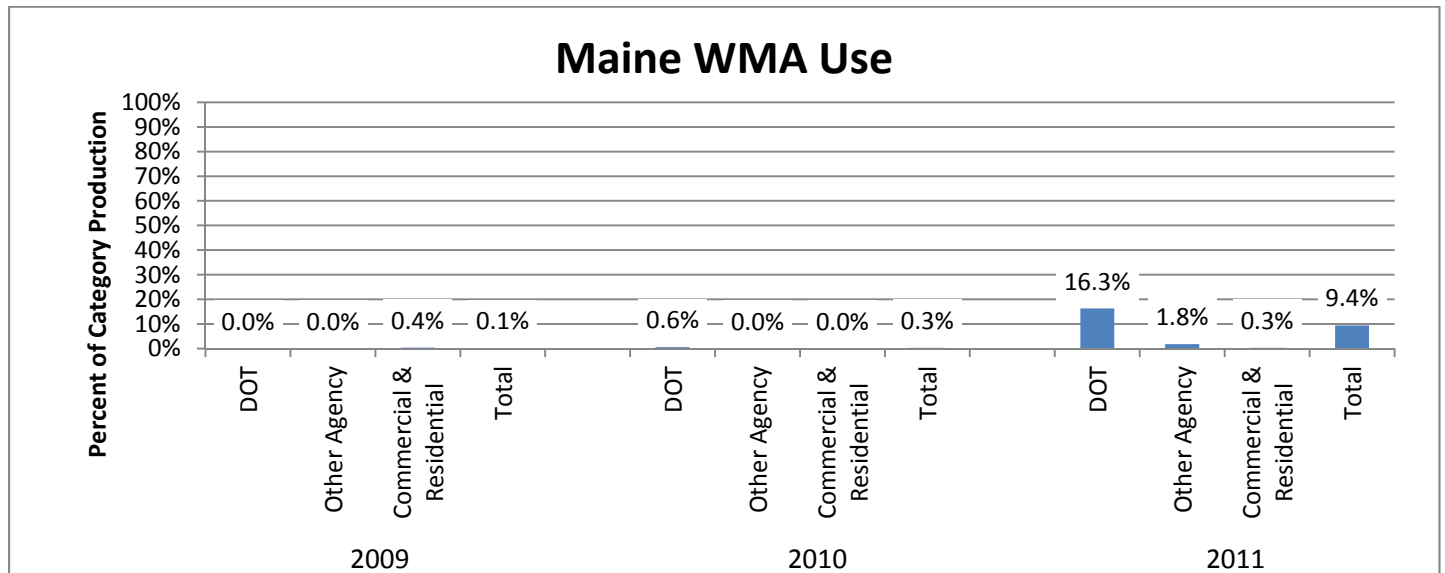


Table B 19: Summary of Maine Data for 2011

Companies Reporting

2

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	852,284	1,047,316
Total Other Agency Tonnage	391,883	481,559
Total Commercial & Residential Tonnage	313,407	385,125
Total Tonnage	1,557,574	1,914,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	182,854	224,697
RAP Tons used in HMA/WMA	230,297	282,997
RAP Tons used as Aggregate	5,580	6,857
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	17%	
Average % RAP in Other Agency Mixes	18%	
Average % RAP in Commercial & Residential Mixes	18%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	100%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	3,990	4,903
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	2%	
Average % RAS in Other Agency Mixes	2%	
Average % RAS in Commercial & Residential Mixes	2%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	138,657	170,386
WMA Other Agency Tonnage	7,008	8,612
WMA Commercial & Residential Tonnage	1,012	1,244
Total WMA Tonnage	146,677	180,242
Percent WMA Tons using Chemical Additives	20.8%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	77.3%	
Percent WMA Tons using Organic Additive	2.0%	

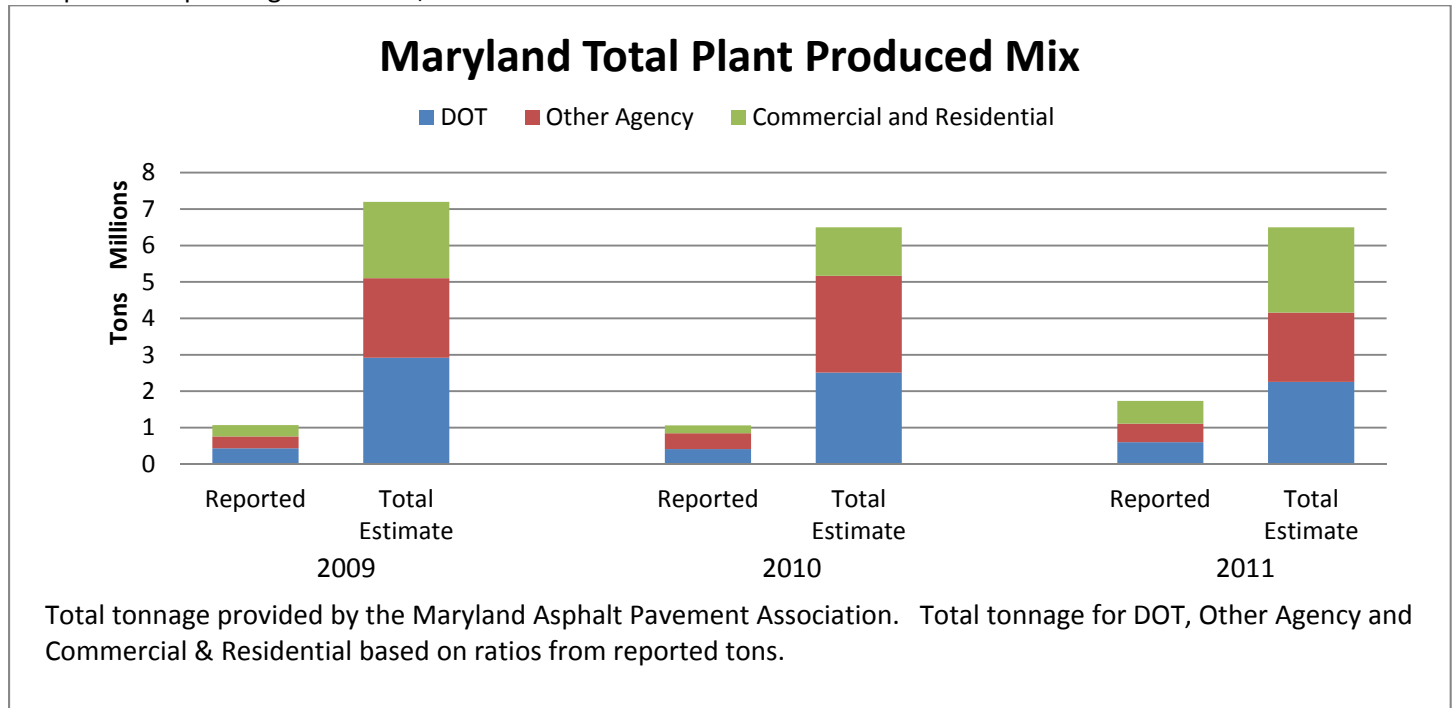
1. DOT tonnage provided by Maine Asphalt Pavement Association and ratio of reported total tons to reported DOT tons used to compute estimated total tons. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Maryland

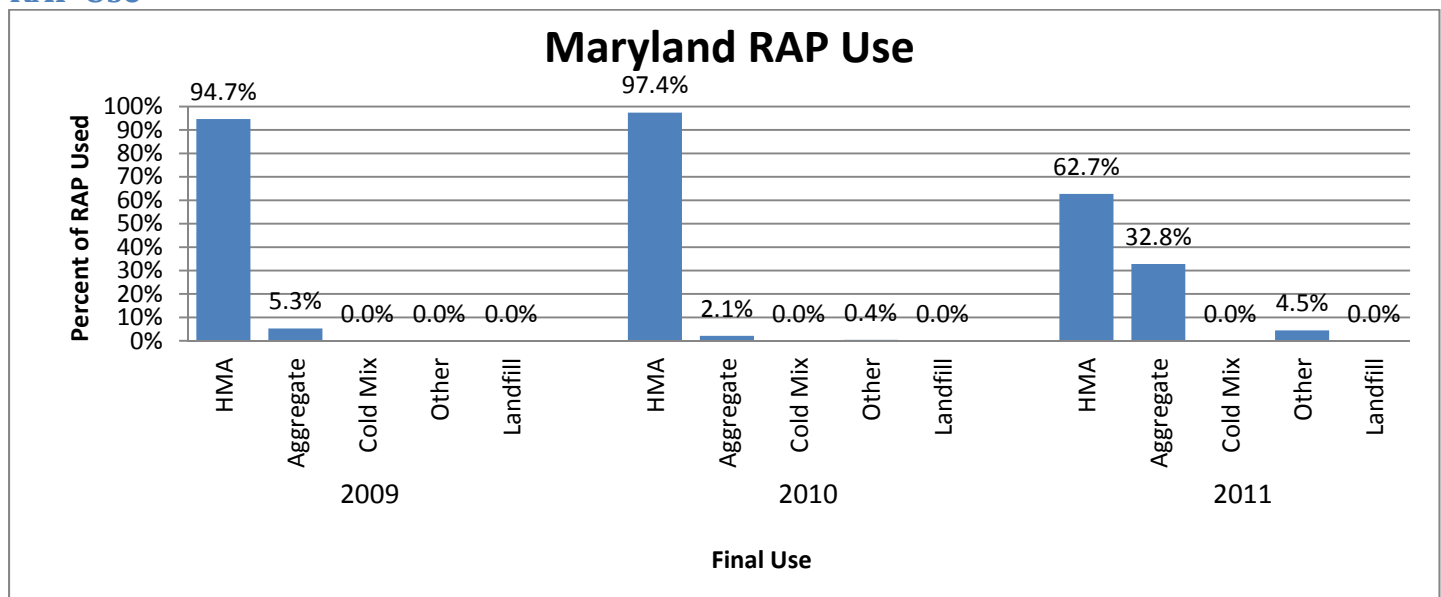
Table B21 summarizes the results received from asphalt mix producers in Maryland. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

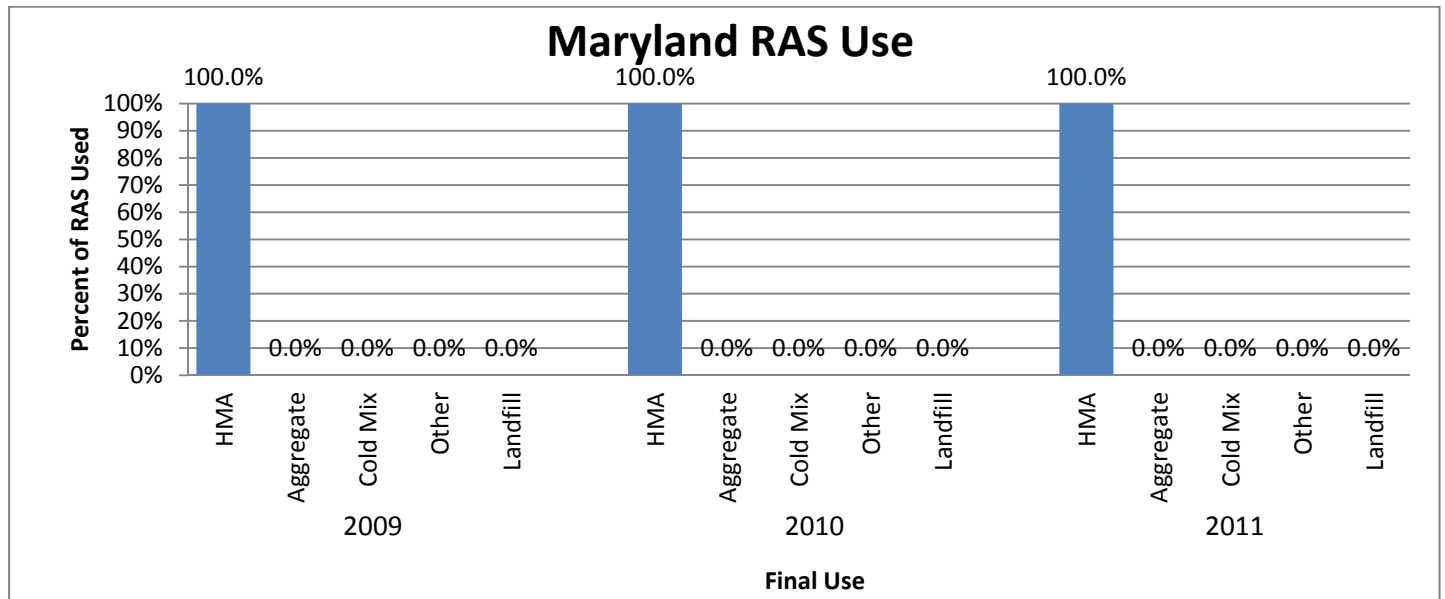
Companies responding: 4 for 2009, 2010 & 2011



### RAP Use



## RAS Use



## WMA Use

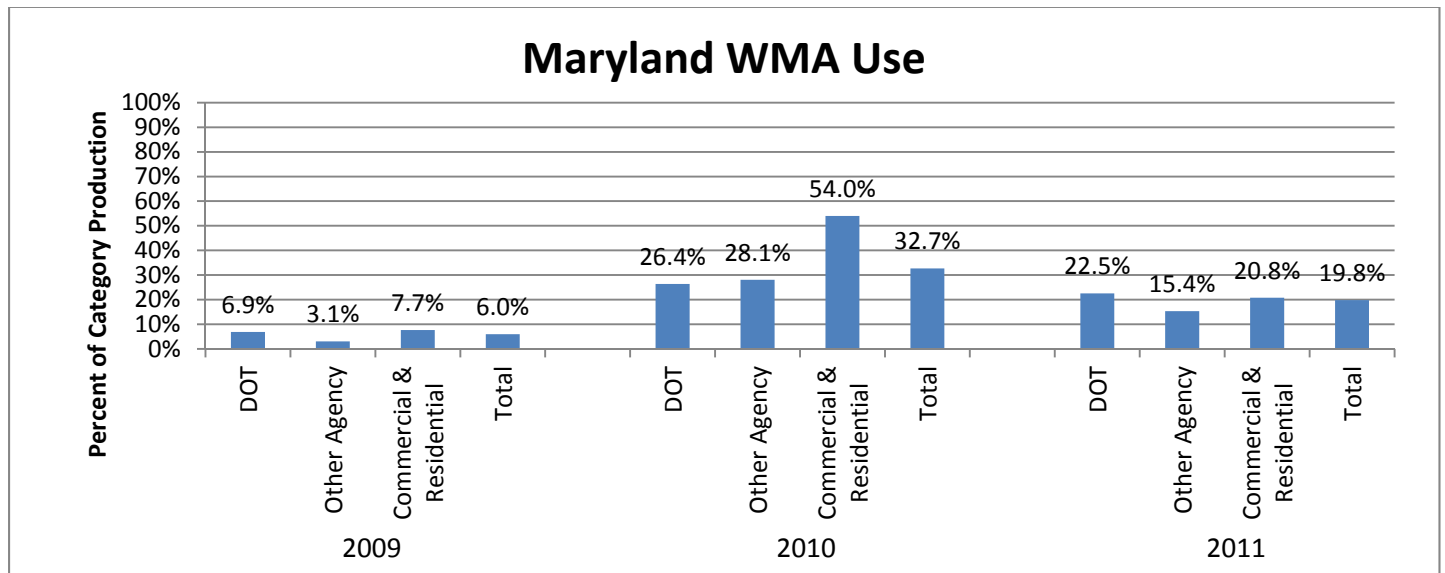


Table B 20: Summary of Maryland Data for 2011

Companies Reporting

4

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	601,480	2,254,398
Total Other Agency Tonnage	507,683	1,902,839
Total Commercial & Residential Tonnage	625,056	2,342,763
Total Tonnage	1,734,219	6,500,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	635,756	2,382,867
RAP Tons used in HMA/WMA	420,765	1,577,063
RAP Tons used as Aggregate	220,000	824,579
RAP Tons used in Cold Mix	50	187
RAP Tons used as Other	30,000	112,443
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	21%	
Average % RAP in Other Agency Mixes	21%	
Average % RAP in Commercial & Residential Mixes	26%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	25%	
RAS Tons Received	20,000	74,962
RAS Tons used in HMA/WMA	10,000	37,481
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	1%	
Average % RAS in Other Agency Mixes	1%	
Average % RAS in Commercial & Residential Mixes	1%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	135,474	507,767
WMA Other Agency Tonnage	77,959	292,195
WMA Commercial & Residential Tonnage	130,011	487,293
Total WMA Tonnage	343,443	1,287,255
Percent WMA Tons using Chemical Additives	2.8%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	97.2%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tonnage provided by the Maryland Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

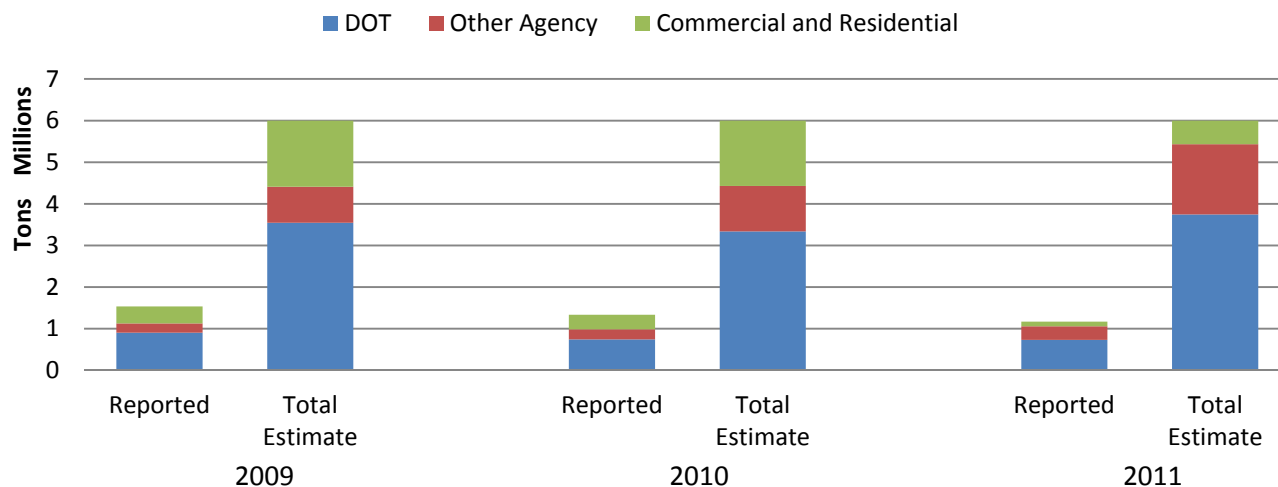
## Massachusetts

Table B22 summarizes the results received from asphalt mix producers in Massachusetts. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 2 for 2009, 2010 & 2011

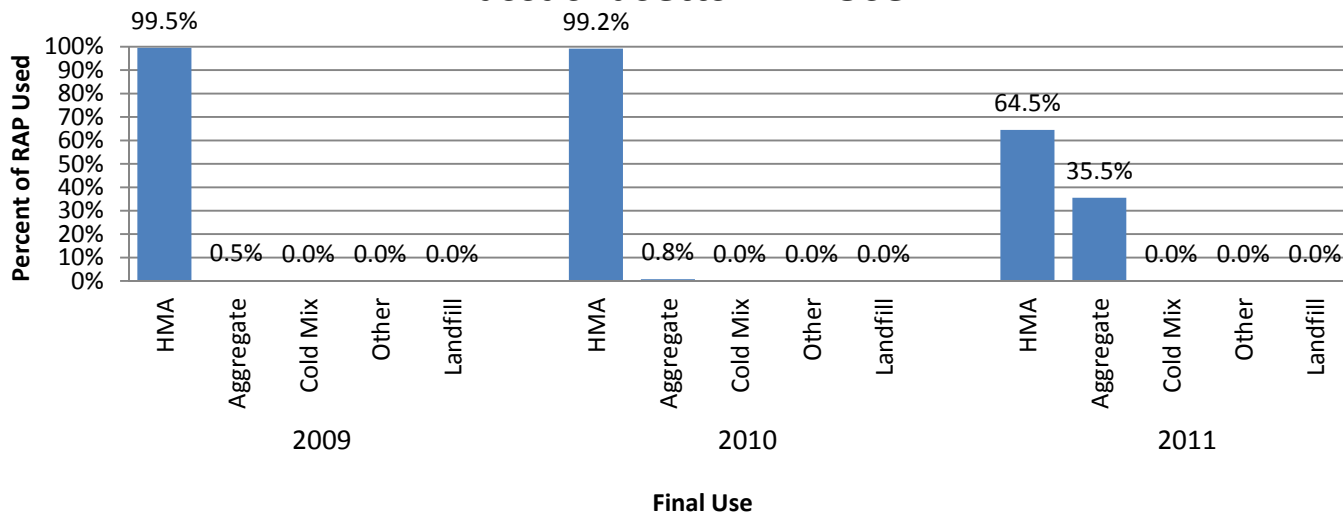
#### Massachusetts Total Plant Produced Mix



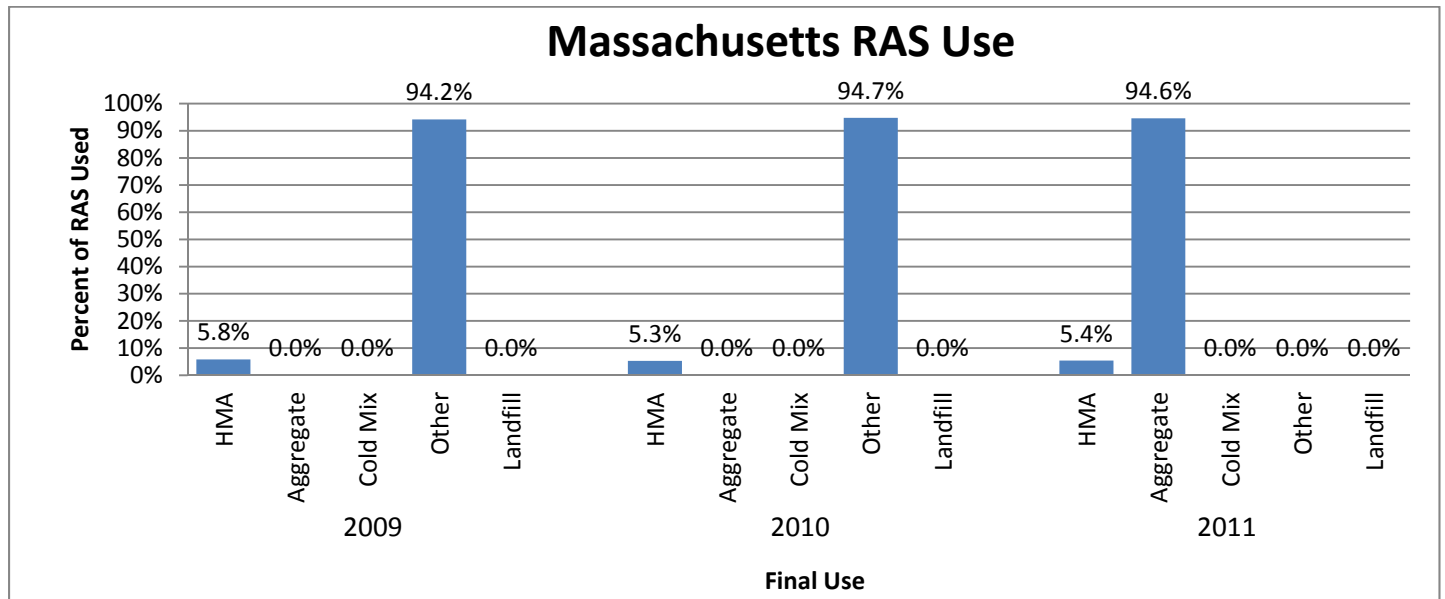
Total tonnage provided by the Massachusetts Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential based on ratios from reported tons.

### RAP Use

#### Massachusetts RAP Use



## RAS Use



## WMA Use

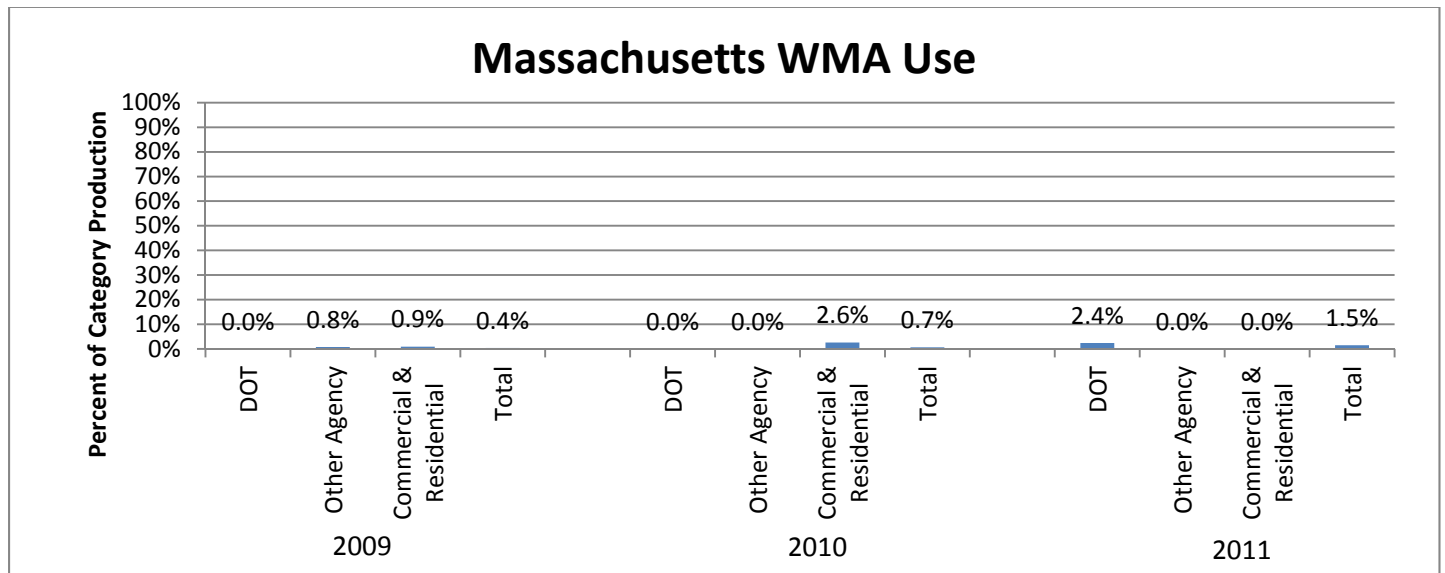




Table B 21: Summary of Massachusetts Data for 2011

Companies Reporting

2

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	731,782	3,747,643
Total Other Agency Tonnage	329,147	1,685,646
Total Commercial & Residential Tonnage	110,659	566,712
Total Tonnage	1,171,587	6,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	160,736	823,171
RAP Tons used in HMA/WMA	129,045	660,875
RAP Tons used as Aggregate	71,125	364,250
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	14%	
Average % RAP in Other Agency Mixes	15%	
Average % RAP in Commercial & Residential Mixes	16%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	100%	
RAS Tons Received	36,396	186,393
RAS Tons used in HMA/WMA	820	4,197
RAS Tons used as Aggregate	14,368	73,582
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	3%	
Average % RAS in Commercial & Residential Mixes	2%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	50%	
WMA DOT Tonnage	17,500	89,622
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	-	-
Total WMA Tonnage	17,500	89,622
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	0.0%	
Percent WMA Tons using Organic Additive	100.0%	

1. Total tonnage provided by the Massachusetts Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

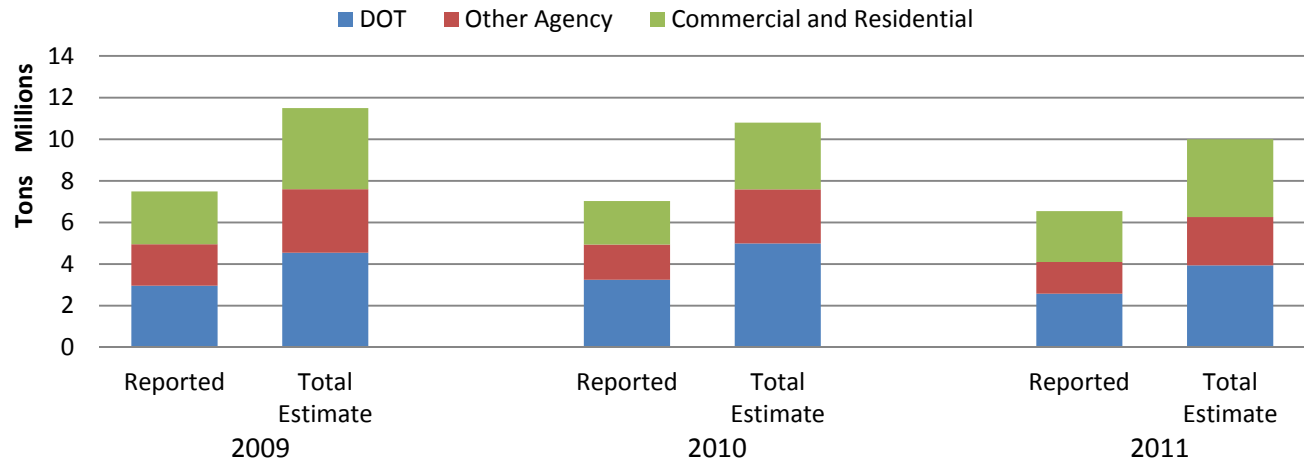
## Michigan

Table B23 summarizes the results received from asphalt mix producers in Michigan. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 8 for 2009 & 2010, 6 for 2011

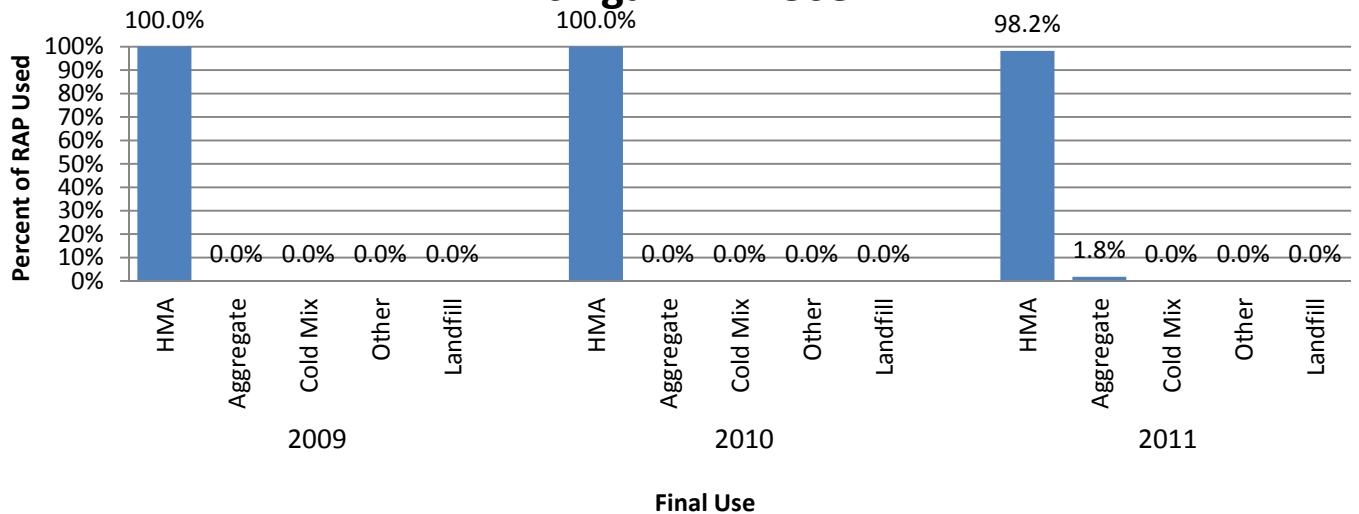
#### Michigan Total Plant Produced Mix



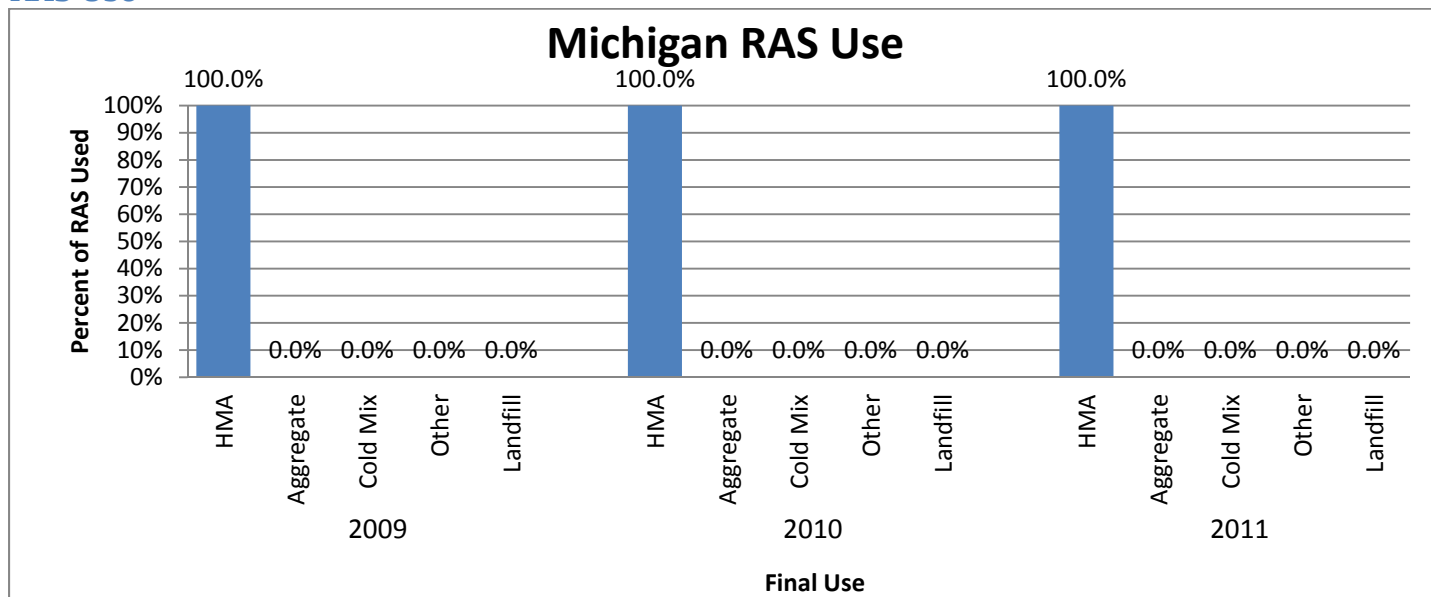
Total tonnage provided by the Asphalt Pavement Association of Michigan . Total tonnage for DOT, Other Agency and Commercial & Residential based on ratios from reported tons.

### RAP Use

#### Michigan RAP Use



## RAS Use



## WMA Use

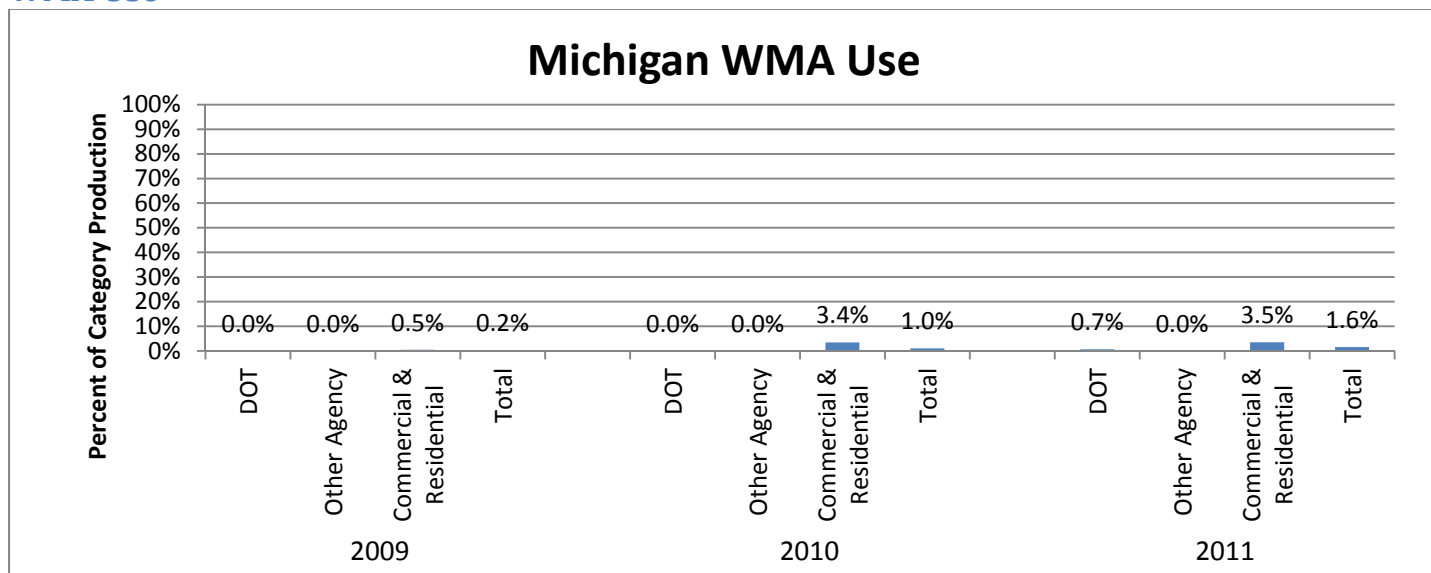


Table B 22: Summary of Michigan Data for 2011

Companies Reporting

6

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	2,576,665	3,937,420
Total Other Agency Tonnage	1,523,058	2,327,395
Total Commercial & Residential Tonnage	2,444,321	3,735,184
Total Tonnage	6,544,043	10,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	2,497,462	3,816,390
RAP Tons used in HMA/WMA	2,338,368	3,573,277
RAP Tons used as Aggregate	42,687	65,230
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	20%	
Average % RAP in Other Agency Mixes	25%	
Average % RAP in Commercial & Residential Mixes	37%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	33%	
RAS Tons Received	28,200	43,093
RAS Tons used in HMA/WMA	19,100	29,187
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	50%	
WMA DOT Tonnage	16,835	25,726
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	85,095	130,035
Total WMA Tonnage	101,930	155,761
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

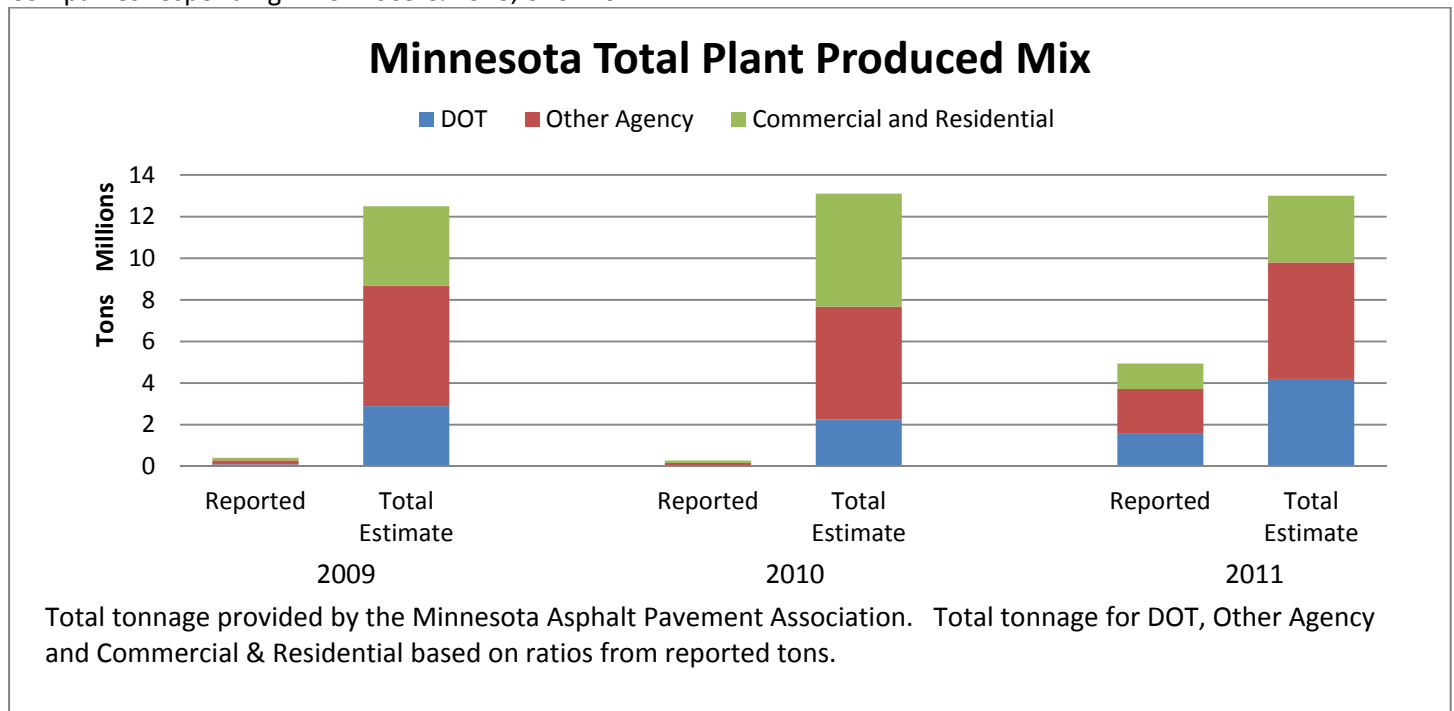
1. Total tonnage provided by the Asphalt Pavement Association of Michigan. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Minnesota

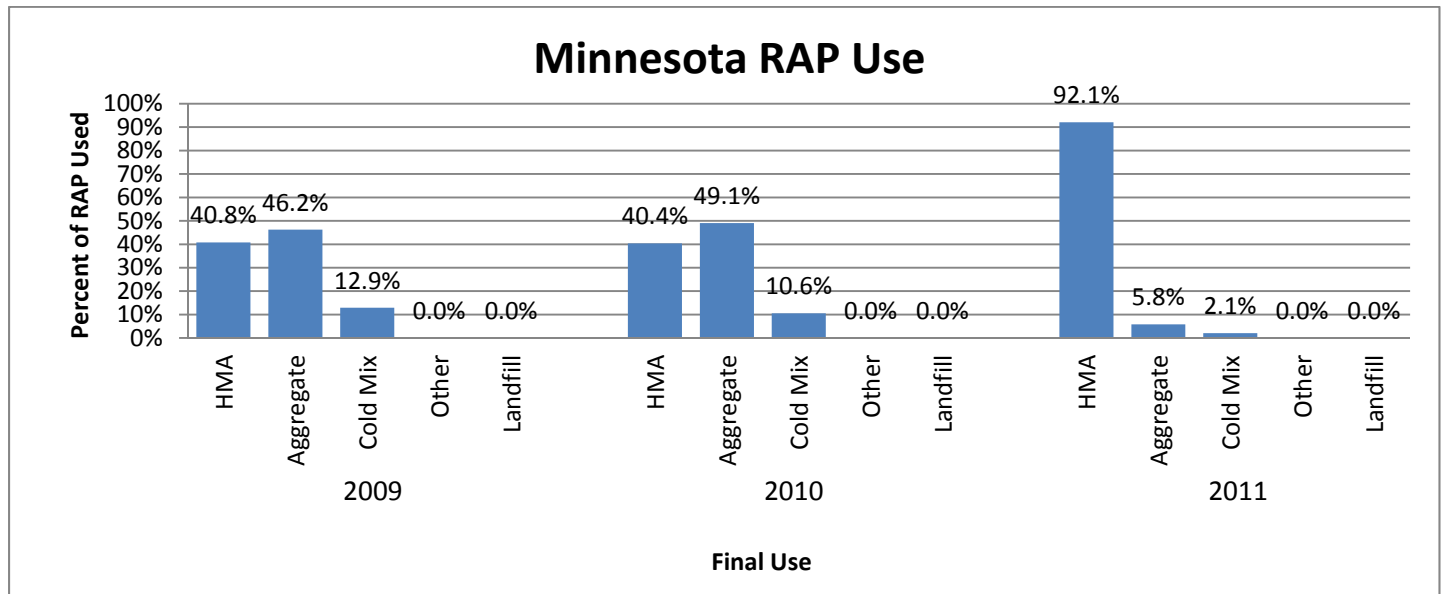
Table B6 summarizes the results received from asphalt mix producers in Minnesota. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

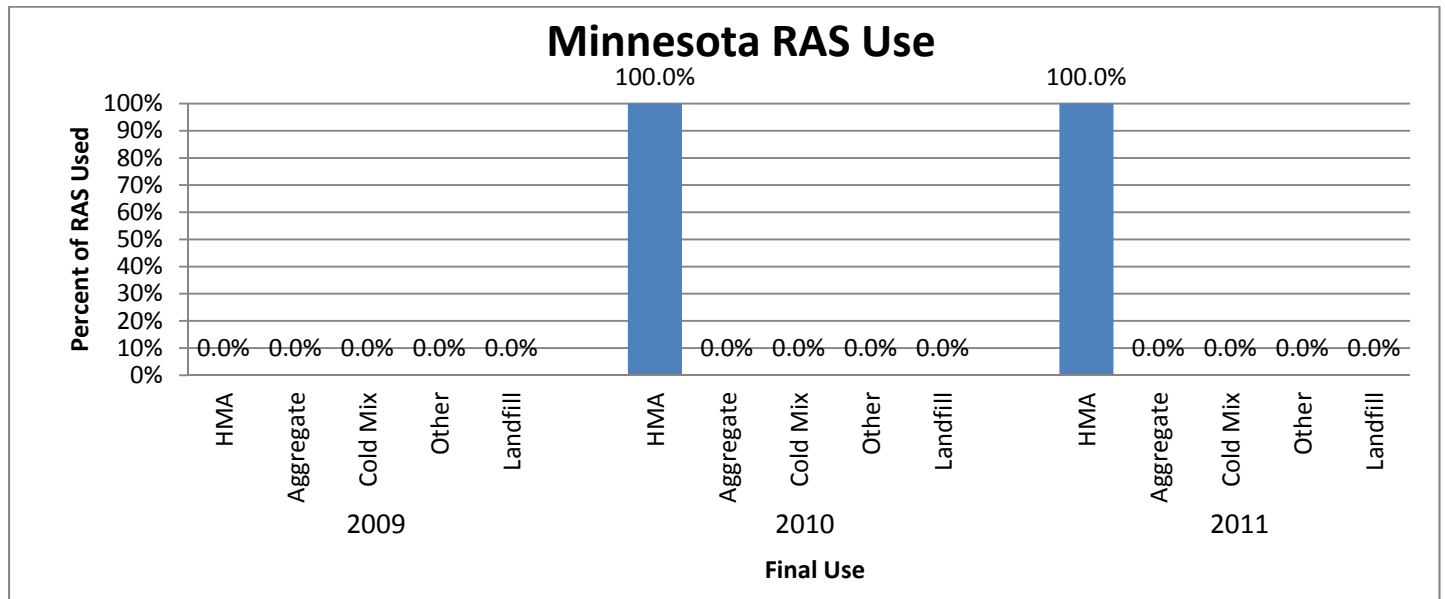
Companies responding: 2 for 2009 & 2010, 6 for 2011



### RAP Use



## RAS Use



## WMA Use

No contractors reported using WMA in 2009 or 2010.

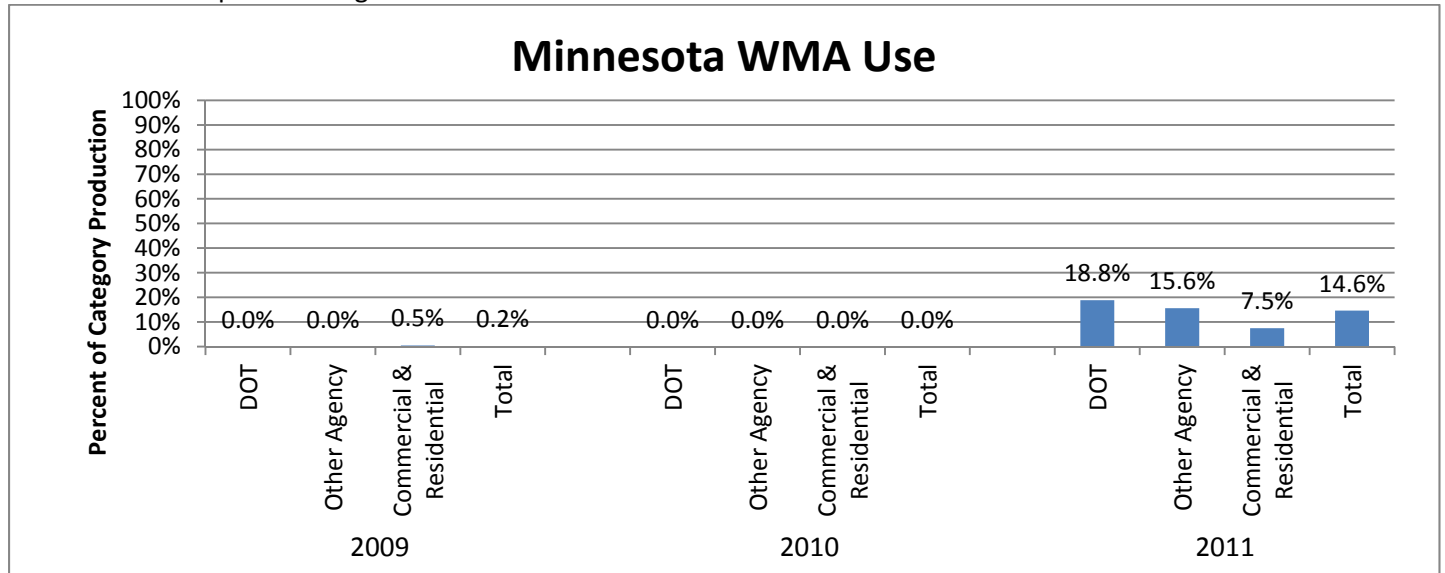


Table B 23: Summary of Minnesota Data for 2011

Companies Reporting

6

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,595,000	4,199,664
Total Other Agency Tonnage	2,126,000	5,597,796
Total Commercial & Residential Tonnage	1,216,300	3,202,540
Total Tonnage	4,937,300	13,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	1,242,000	3,270,208
RAP Tons used in HMA/WMA	1,107,784	2,916,815
RAP Tons used as Aggregate	70,000	184,311
RAP Tons used in Cold Mix	25,000	65,825
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	21%	
Average % RAP in Other Agency Mixes	23%	
Average % RAP in Commercial & Residential Mixes	23%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	67%	
RAS Tons Received	25,000	65,825
RAS Tons used in HMA/WMA	27,563	72,573
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	2%	
Average % RAS in Other Agency Mixes	4%	
Average % RAS in Commercial & Residential Mixes	5%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	67%	
WMA DOT Tonnage	300,000	789,905
WMA Other Agency Tonnage	332,000	874,162
WMA Commercial & Residential Tonnage	91,000	239,605
Total WMA Tonnage	723,000	1,903,672
Percent WMA Tons using Chemical Additives	2.2%	
Percent WMA Tons using Additive Foaming	0.6%	
Percent WMA Tons using Plant Foaming	97.2%	
Percent WMA Tons using Organic Additive	0.0%	

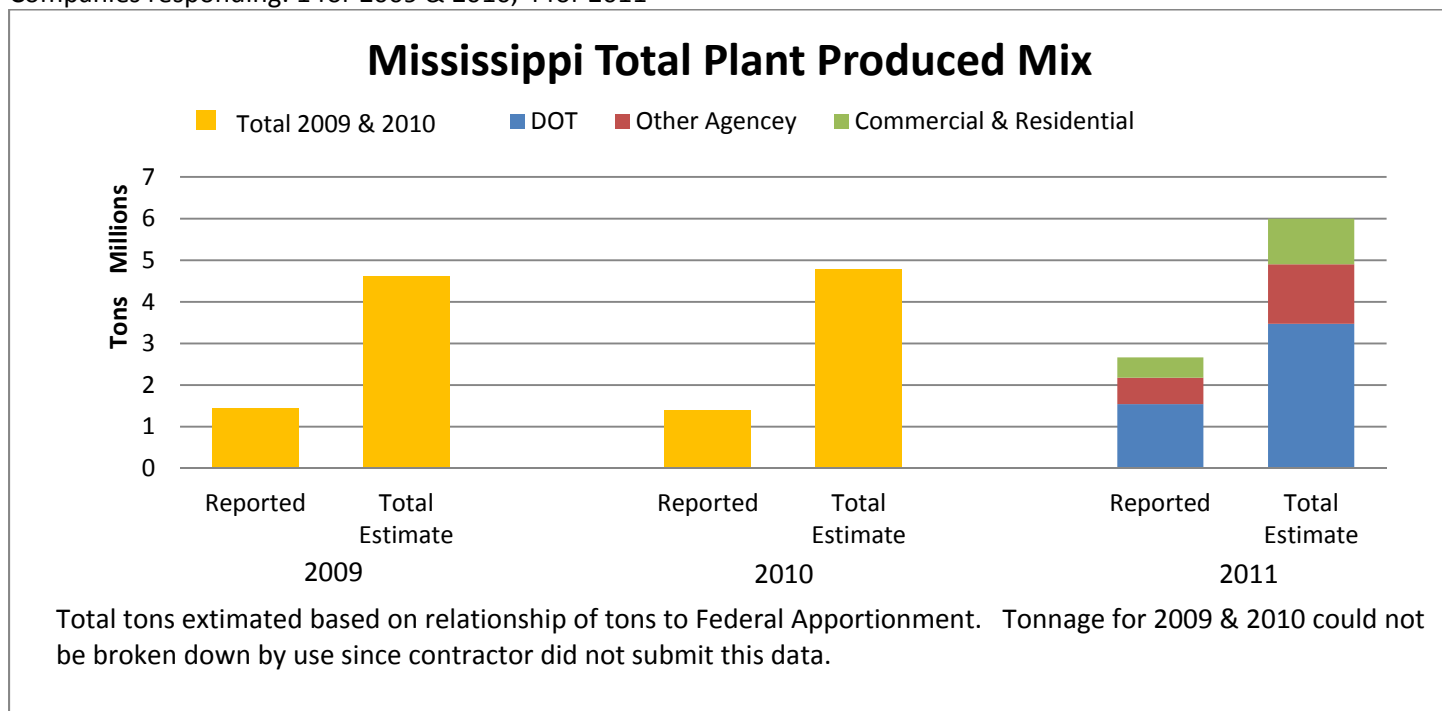
1. Total tonnage provided by the Minnesota Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Mississippi

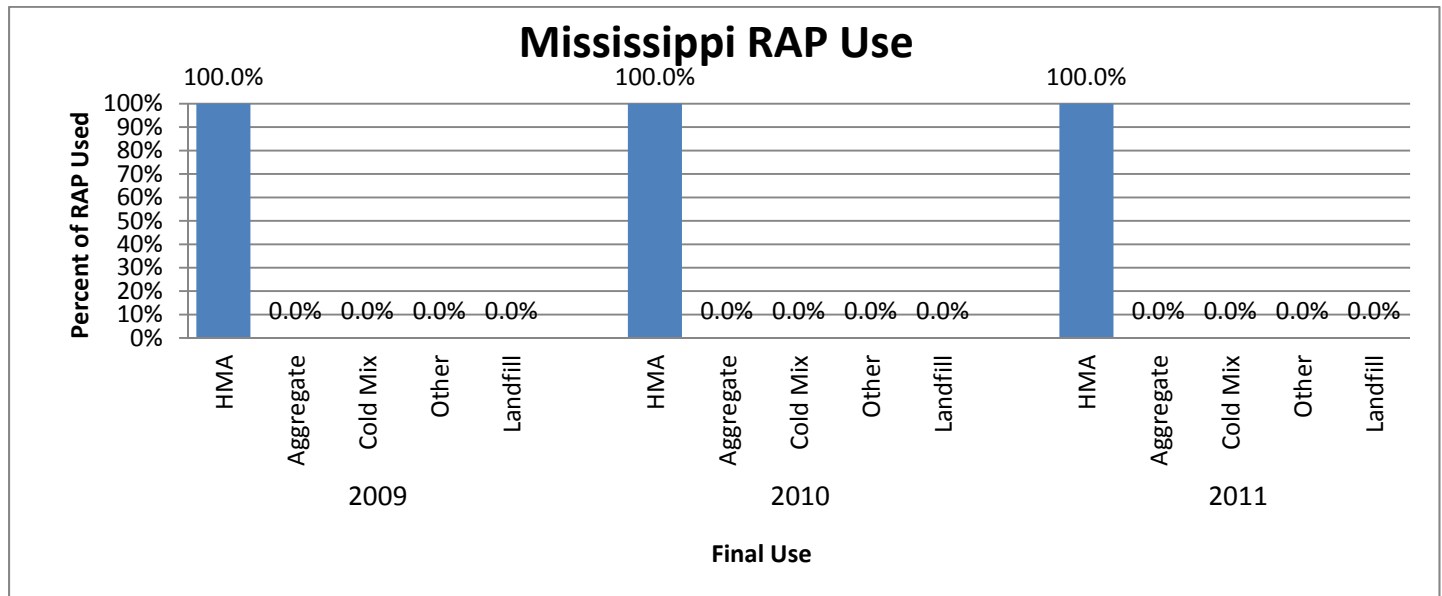
Table B25 summarizes the results received from asphalt mix producers in Mississippi. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 1 for 2009 & 2010, 4 for 2011



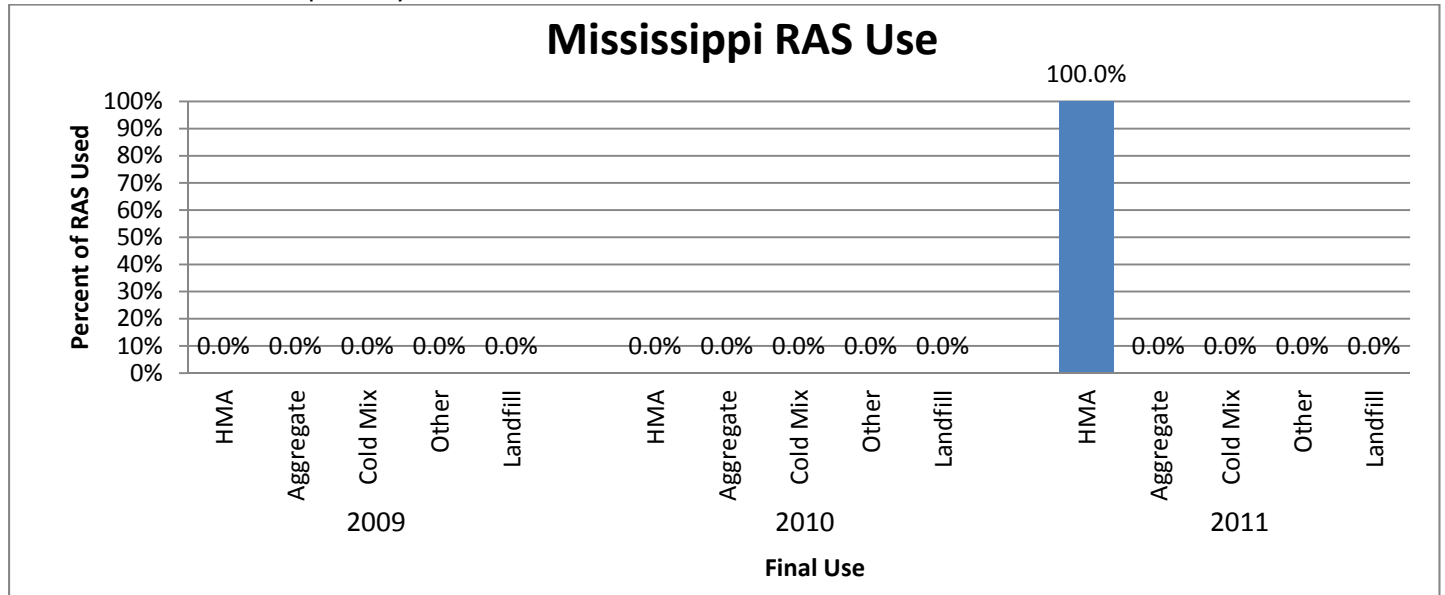
### RAP Use





## RAS Use

The contractor did not report any RAS use in 2009 or 2010.



## WMA Use

The contractor did not report an WMA use in 2009 or 2010.

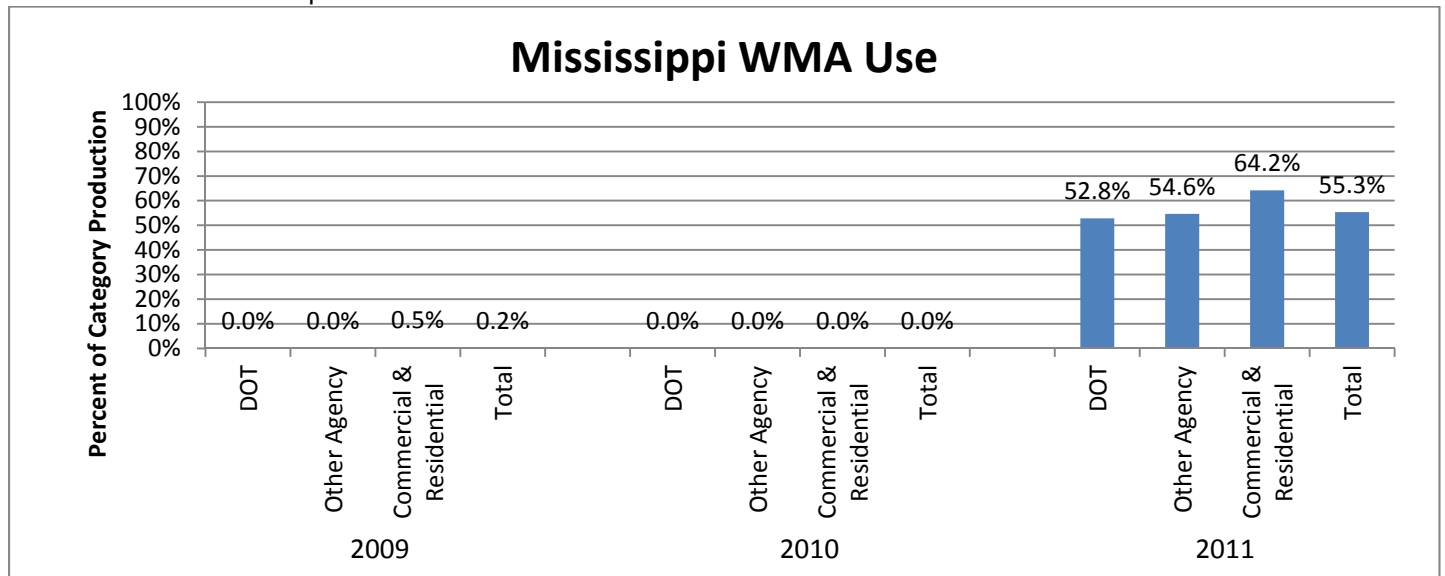


Table B 24: Summary of Mississippi Data for 2011

Companies Reporting

4

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,543,164	3,471,548
Total Other Agency Tonnage	635,866	1,430,463
Total Commercial & Residential Tonnage	488,075	1,097,988
Total Tonnage	2,667,105	6,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	335,179	754,029
RAP Tons used in HMA/WMA	482,960	1,086,482
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	15%	
Average % RAP in Other Agency Mixes	16%	
Average % RAP in Commercial & Residential Mixes	22%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	2,000	4,499
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	2%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	815,307	1,834,139
WMA Other Agency Tonnage	347,500	781,747
WMA Commercial & Residential Tonnage	313,268	704,736
Total WMA Tonnage	1,476,074	3,320,621
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

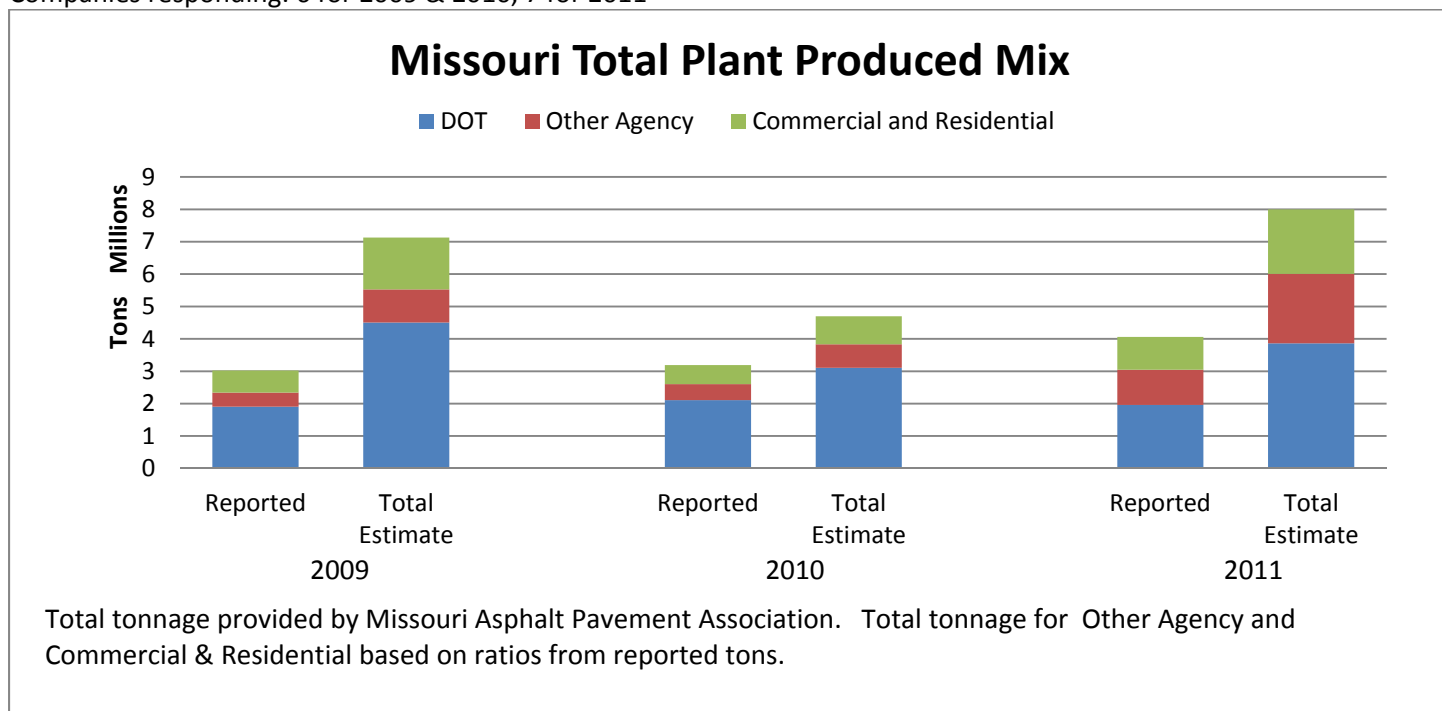
1. Total tonnage provided by the Mississippi Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Missouri

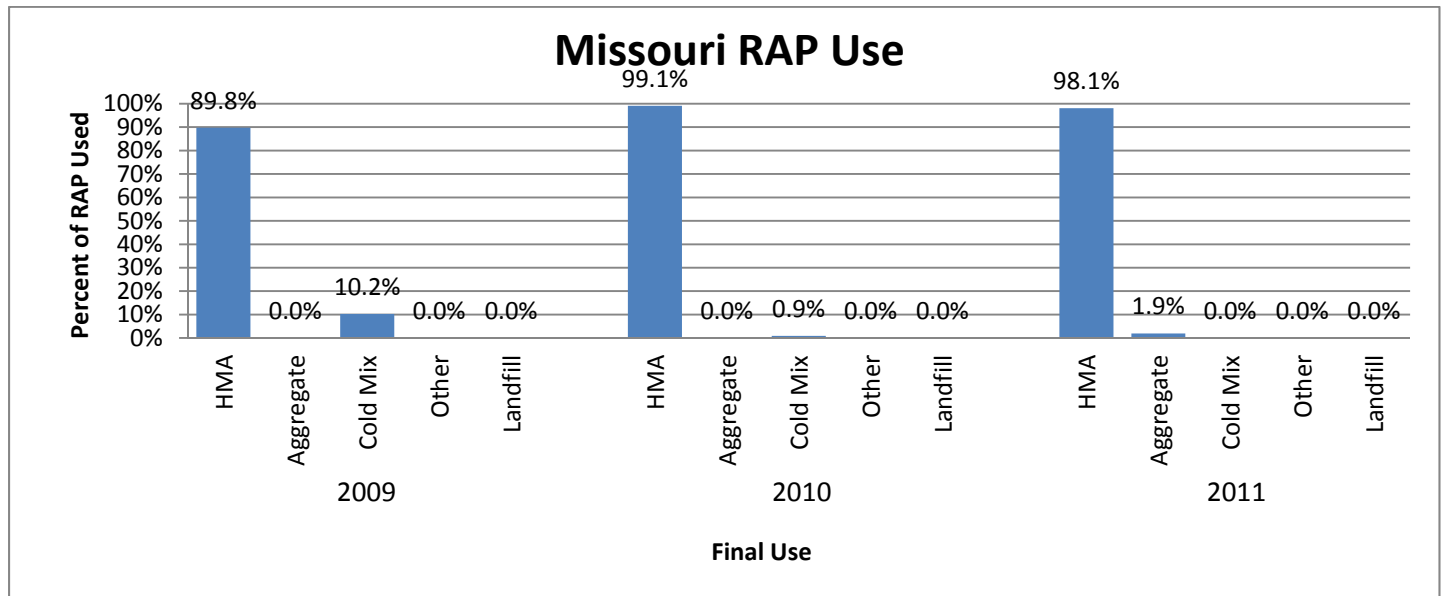
Table B26 summarizes the results received from asphalt mix producers in Missouri. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

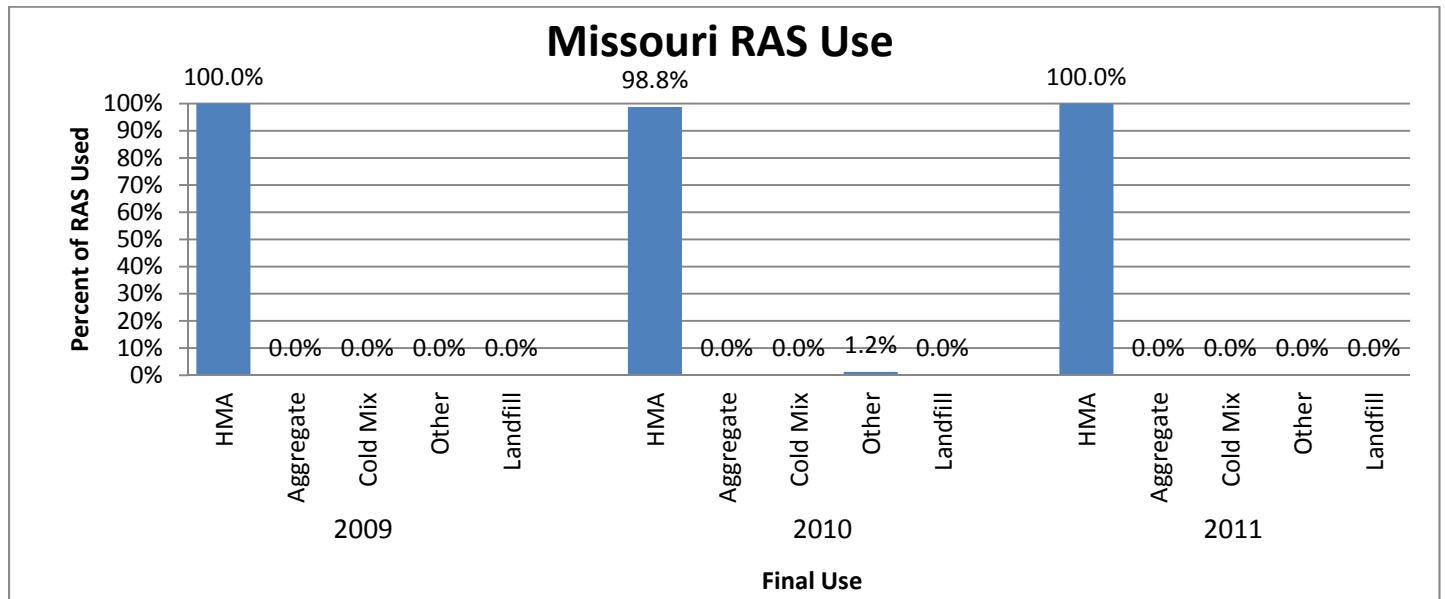
Companies responding: 6 for 2009 & 2010, 7 for 2011



### RAP Use



## RAS Use



## WMA Use

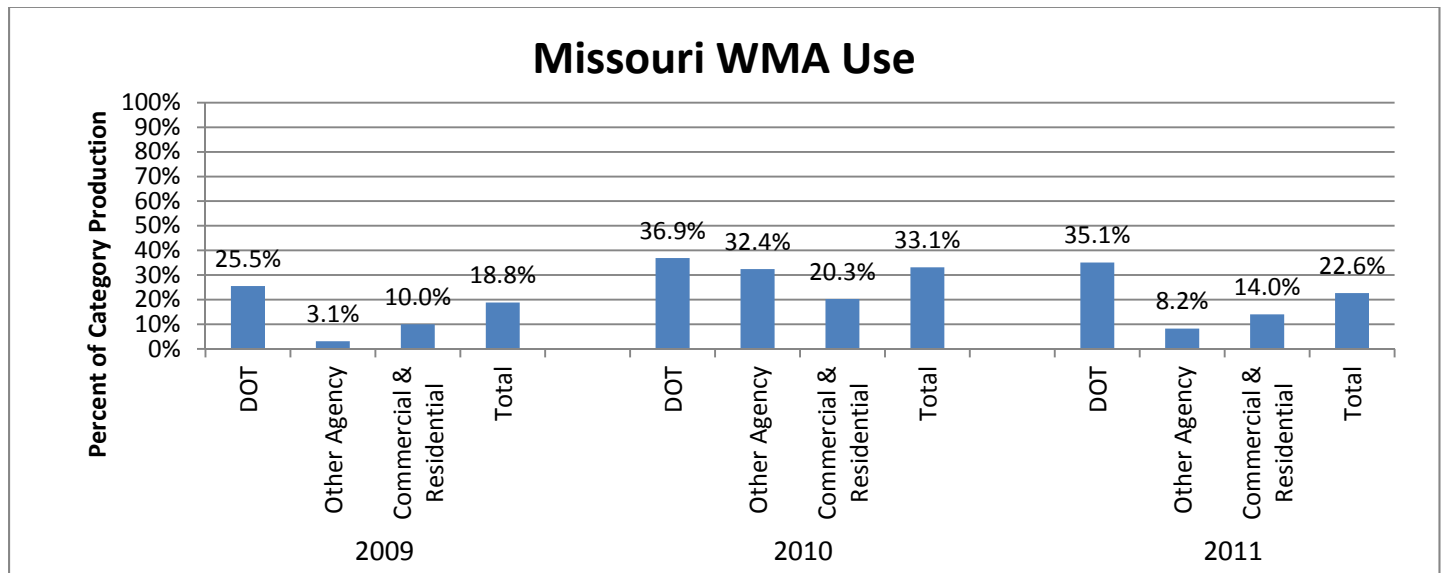


Table B 25: Summary of Missouri Data for 2011

Companies Reporting

7

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,958,331	3,860,441
Total Other Agency Tonnage	1,090,020	2,148,747
Total Commercial & Residential Tonnage	1,009,902	1,990,811
Total Tonnage	4,058,253	8,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	830,951	1,638,047
RAP Tons used in HMA/WMA	767,538	1,513,040
RAP Tons used as Aggregate	15,000	29,569
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	16%	
Average % RAP in Other Agency Mixes	22%	
Average % RAP in Commercial & Residential Mixes	22%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	86%	
RAS Tons Received	100,569	198,251
RAS Tons used in HMA/WMA	93,441	184,199
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	3%	
Average % RAS in Other Agency Mixes	3%	
Average % RAS in Commercial & Residential Mixes	3%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	57%	
WMA DOT Tonnage	687,500	1,355,263
WMA Other Agency Tonnage	89,800	177,022
WMA Commercial & Residential Tonnage	141,635	279,203
Total WMA Tonnage	918,935	1,811,488
Percent WMA Tons using Chemical Additives	13.8%	
Percent WMA Tons using Additive Foaming	0.2%	
Percent WMA Tons using Plant Foaming	83.9%	
Percent WMA Tons using Organic Additive	2.1%	

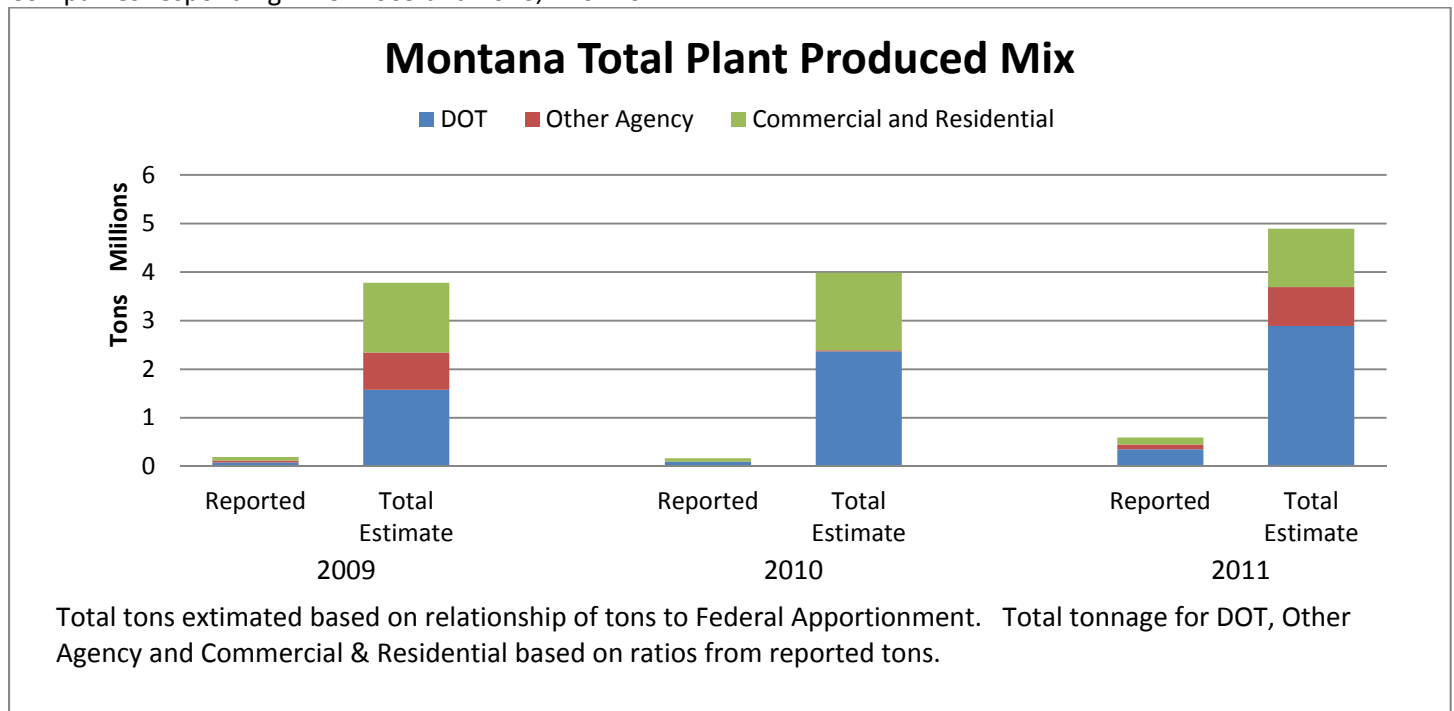
1. Total tonnage provided by Missouri Asphalt Pavement. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Montana

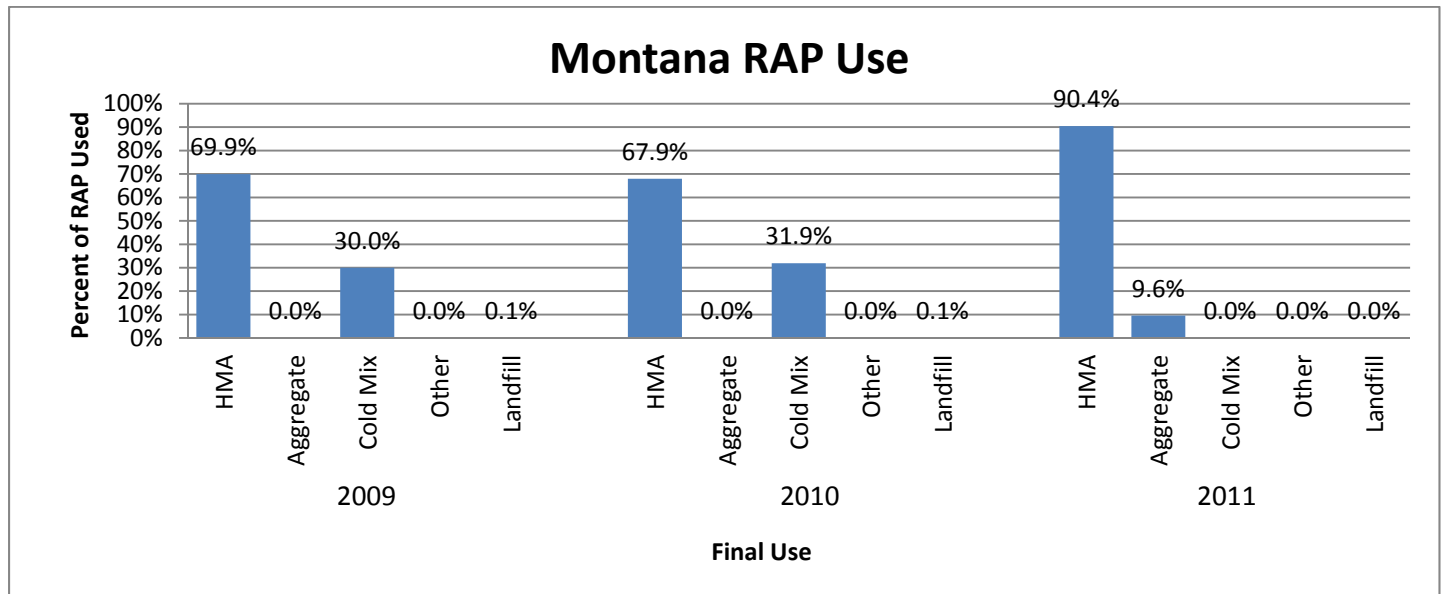
Table B27 summarizes the results received from asphalt mix producers in Montana. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 2 for 2009 and 2010, 4 for 2011



### RAP Use



### RAS Use

No contractors reported using RAS in 2009, 2010 or 2011.

## WMA Use

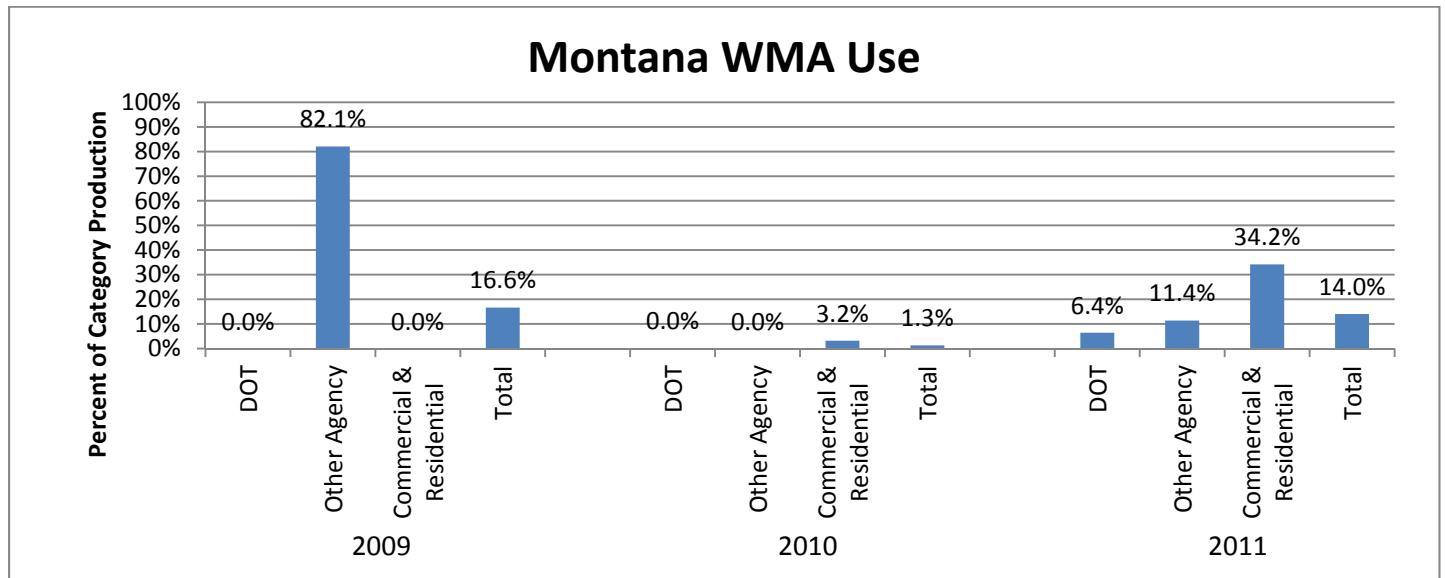


Table B 26: Summary of Montana Data for 2011

Companies Reporting

4

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	351,394	2,890,082
Total Other Agency Tonnage	97,494	801,851
Total Commercial & Residential Tonnage	146,033	1,201,066
Total Tonnage	594,921	4,893,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	75%	
RAP Tons Received	59,751	491,429
RAP Tons used in HMA/WMA	49,293	405,415
RAP Tons used as Aggregate	5,221	42,941
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	6%	
Average % RAP in Other Agency Mixes	12%	
Average % RAP in Commercial & Residential Mixes	18%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	50%	
WMA DOT Tonnage	22,500	185,054
WMA Other Agency Tonnage	11,109	91,367
WMA Commercial & Residential Tonnage	49,933	410,681
Total WMA Tonnage	83,542	687,102
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

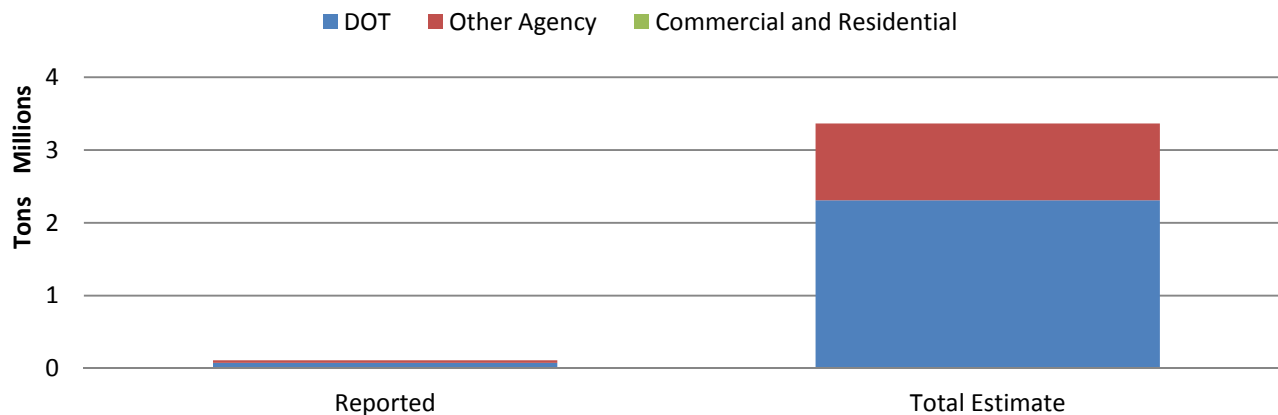
1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.



## Nebraska

No contractors submitted data for the Nebraska for 2009 and 2010. One contractor submitted data for 2011. Total tons were estimated based on a relationship tons to federal apportionment. Because RAP use is prevalent in all areas of the US it was estimated that RAP use in Nebraska followed a national average for 2009 and 2010. Table B28 summarizes this data.

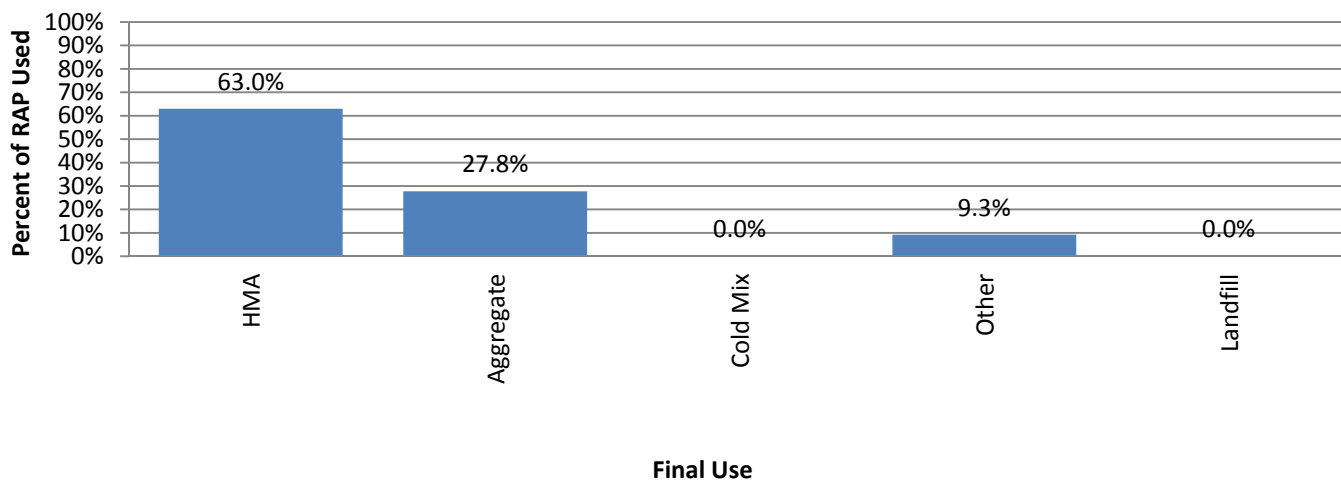
### Nebraska Total Plant Produced Mix 2011



Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential based on ratios from reported tons.

## RAP Use

### Nebraska RAP Use 2011



## RAS Use

No companies in Nebraska responded to the 2009 and 2010 survey. No RAS use was reported in 2011

## WMA Use

No companies in Nebraska responded to the 2009 and 2010 survey. No WMA use was reported in 2011

Table B 27: Summary of Nebraska Data for 2011

Companies Reporting

1

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	76,545	2,309,834
Total Other Agency Tonnage	35,000	1,056,166
Total Commercial & Residential Tonnage	0	0
Total Tonnage	111,545	3,366,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	-	-
RAP Tons used in HMA/WMA	34,000	1,025,990
RAP Tons used as Aggregate	15,000	452,642
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	5,000	150,881
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	30%	
Average % RAP in Other Agency Mixes	20%	
Average % RAP in Commercial & Residential Mixes	0%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA		-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	0%	
WMA DOT Tonnage		-
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	-	-
Total WMA Tonnage	-	-
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	0.0%	
Percent WMA Tons using Organic Additive	0.0%	

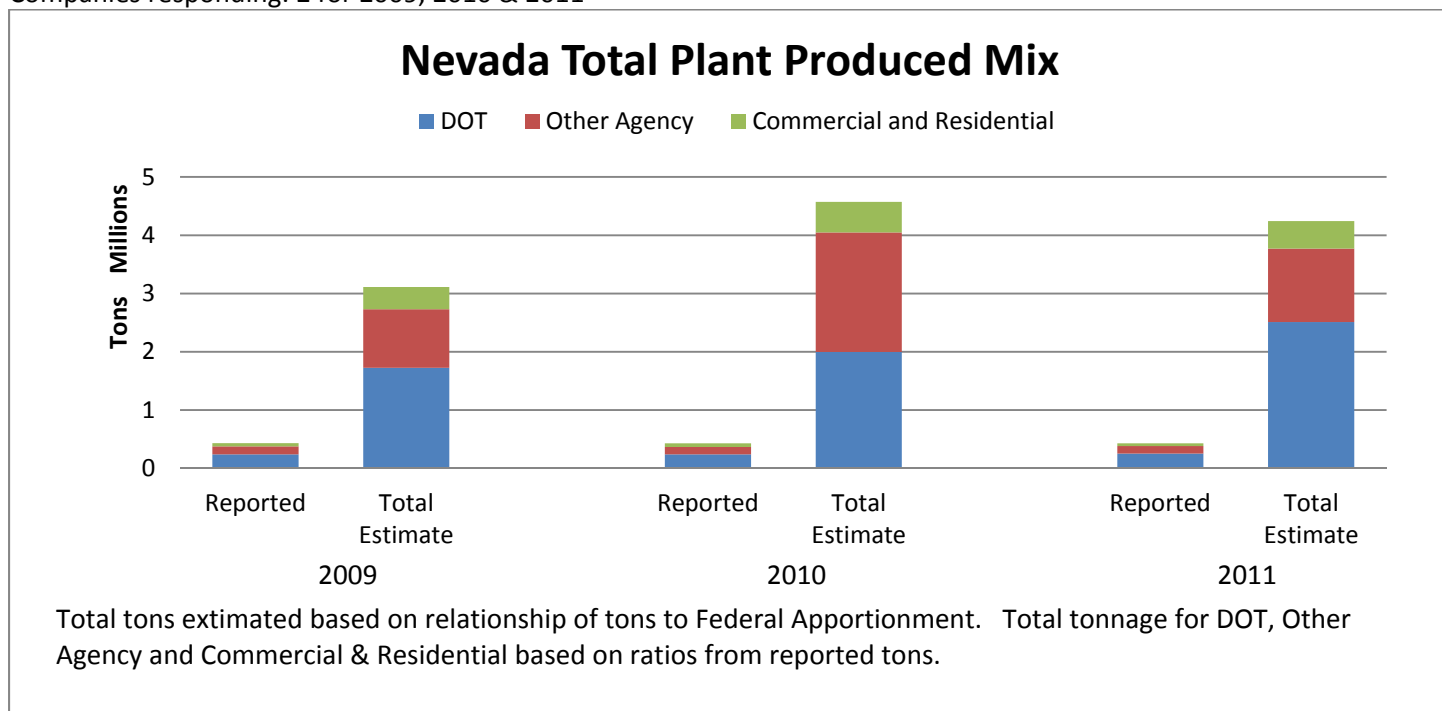
1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Nevada

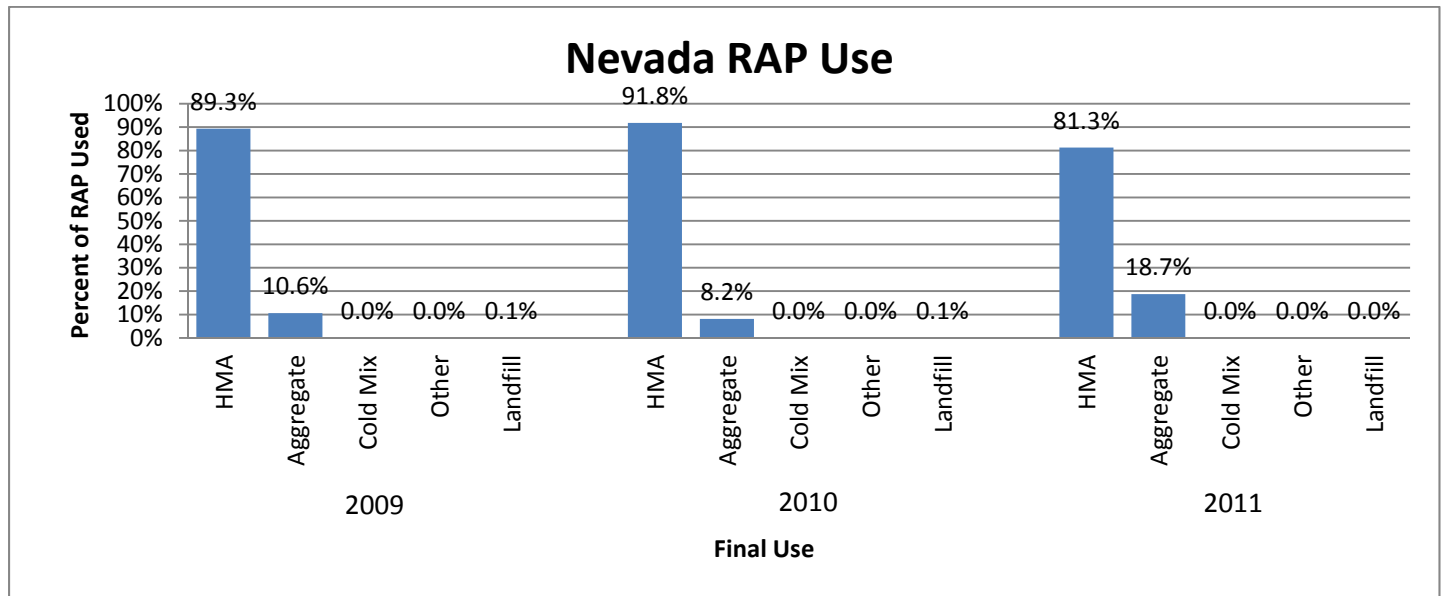
Table B29 summarizes the results received from asphalt mix producers in Nevada. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

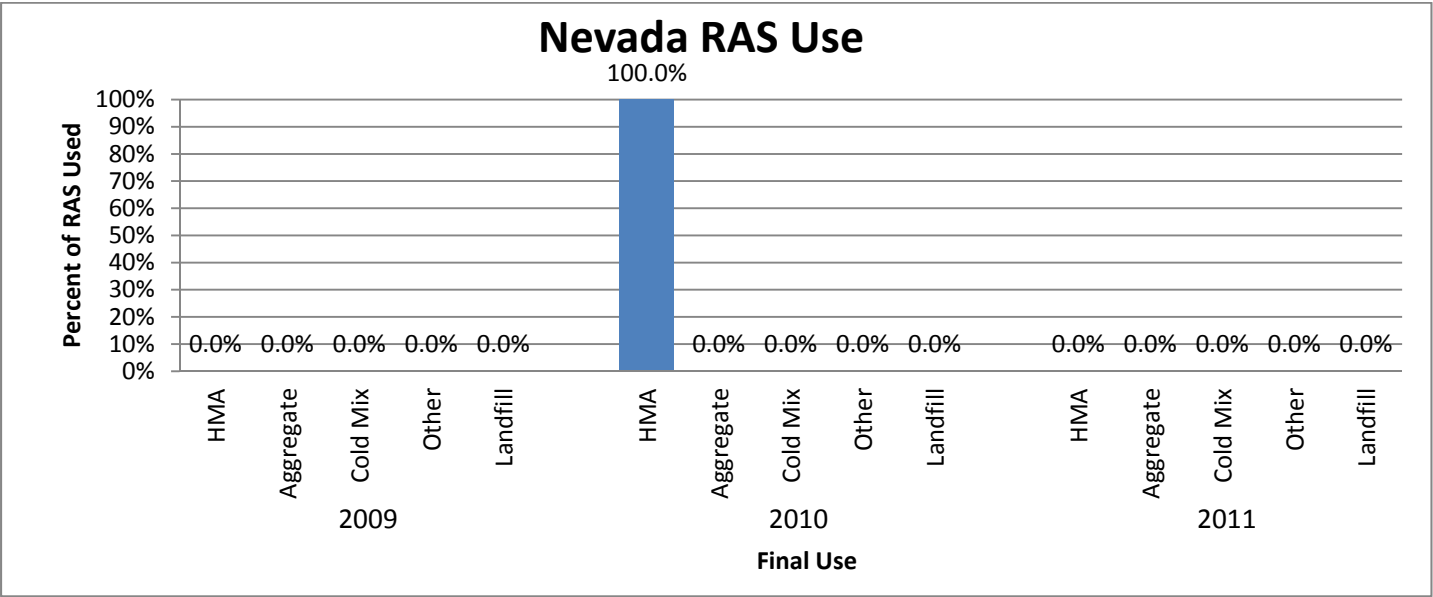
Companies responding: 2 for 2009, 2010 & 2011



### RAP Use



RAS Use



WMA Use

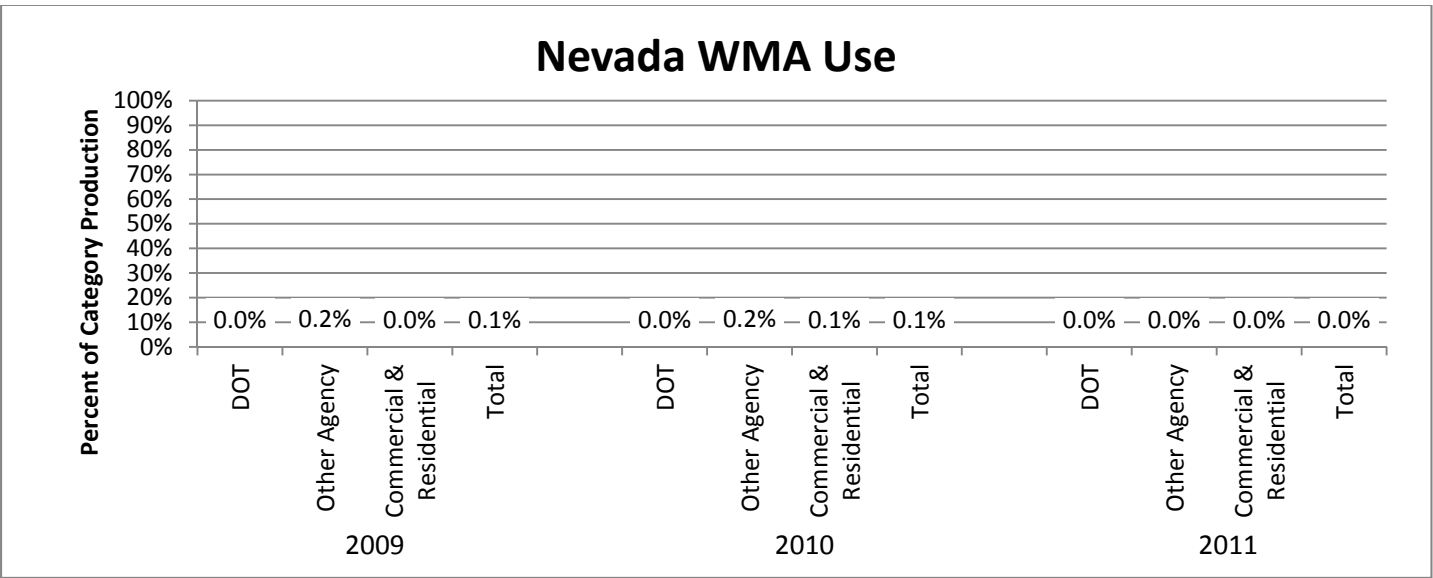


Table B 28: Summary of Nevada Data for 2011

Companies Reporting

2

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	255,000	2,510,010
Total Other Agency Tonnage	128,000	1,259,927
Total Commercial & Residential Tonnage	48,060	473,063
Total Tonnage	431,060	4,243,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	66,500	654,571
RAP Tons used in HMA/WMA	43,406	427,253
RAP Tons used as Aggregate	10,000	98,432
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	0%	
Average % RAP in Other Agency Mixes	9%	
Average % RAP in Commercial & Residential Mixes	16%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	50%	
WMA DOT Tonnage	-	-
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	5	50
Total WMA Tonnage	5	50
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

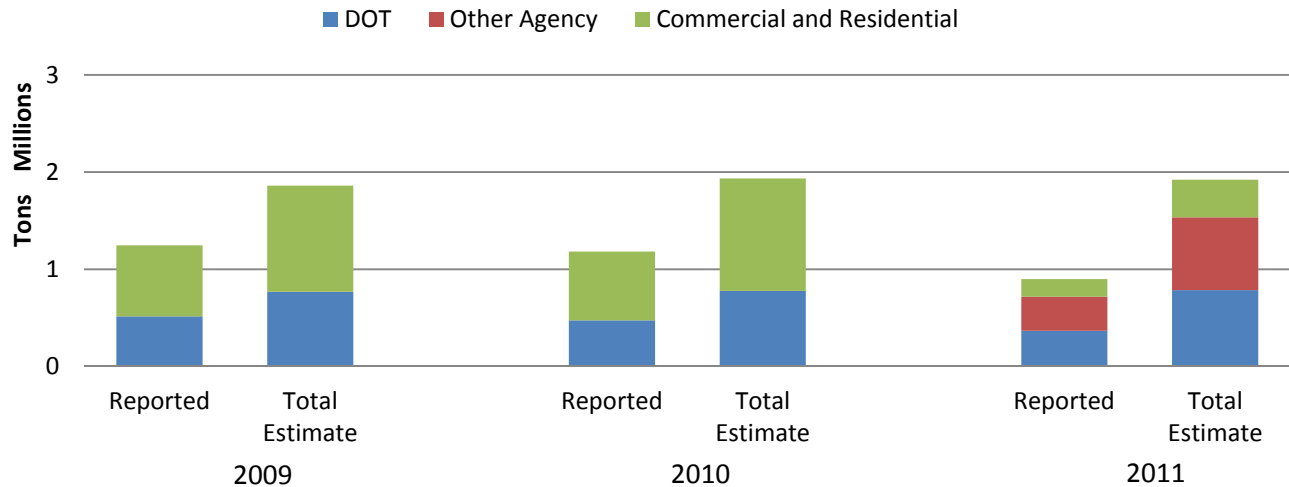
## New Hampshire

Table B30 summarizes the results received from asphalt mix producers in New Hampshire. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 1 for 2009, 2010 & 2011

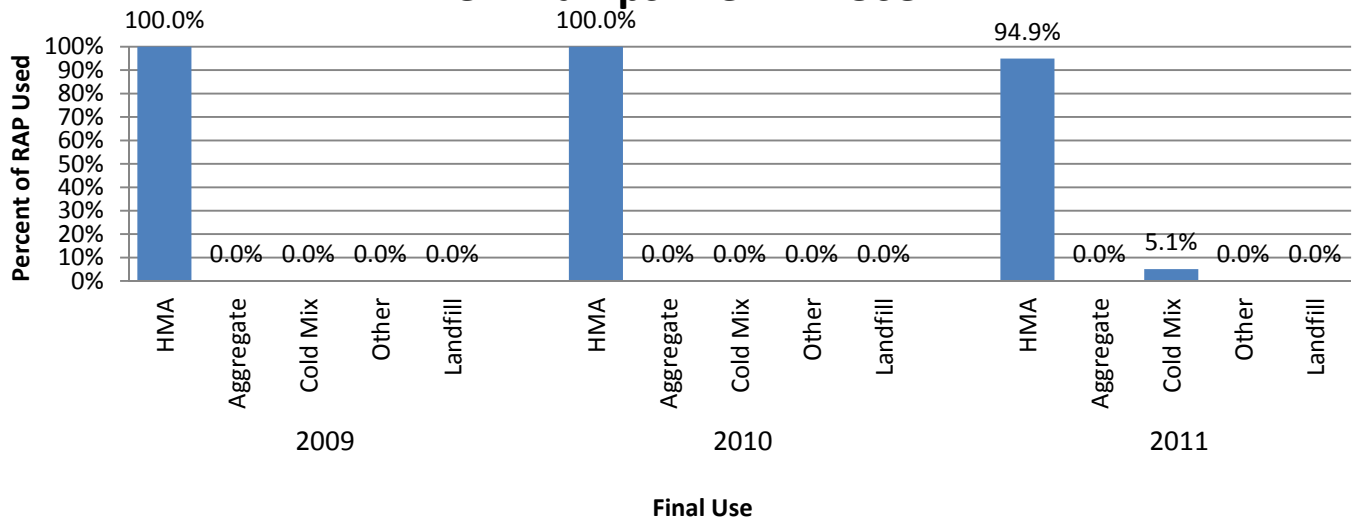
#### New Hampshire Total Plant Produced Mix



Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential based on ratios from reported tons.

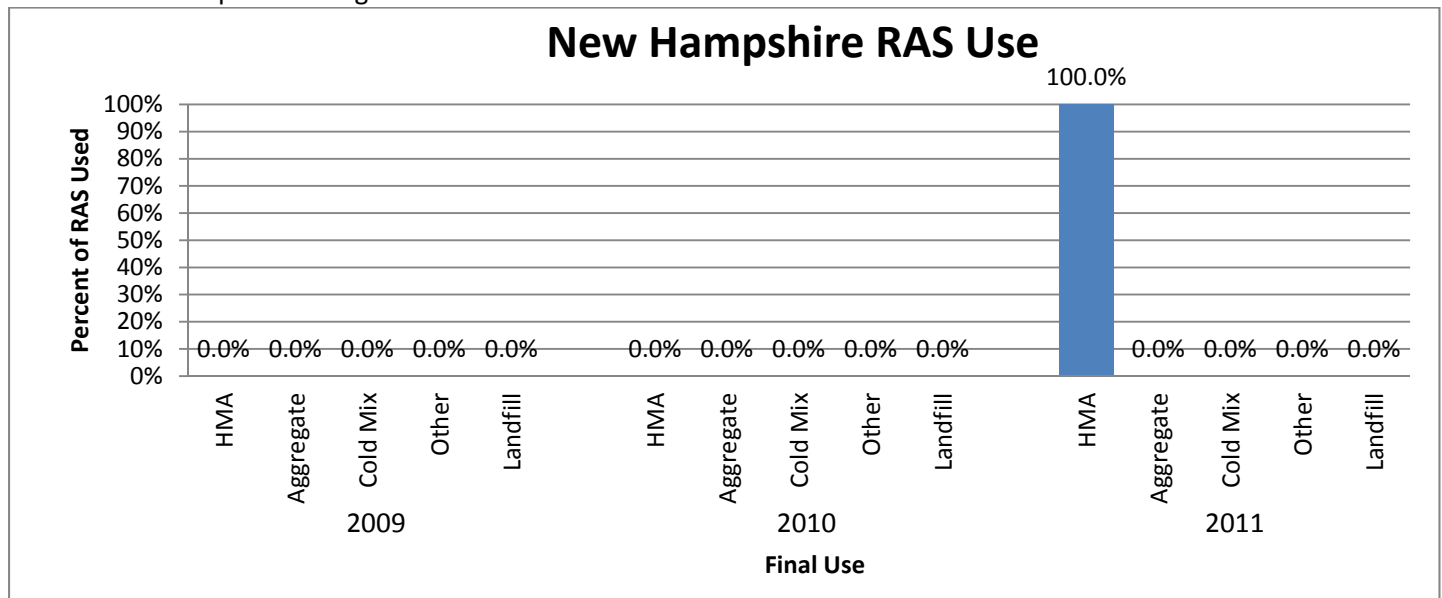
### RAP Use

#### New Hampshire RAP Use



## RAS Use

No contractors reported using RAS in 2009 or 2010.



## WMA Use

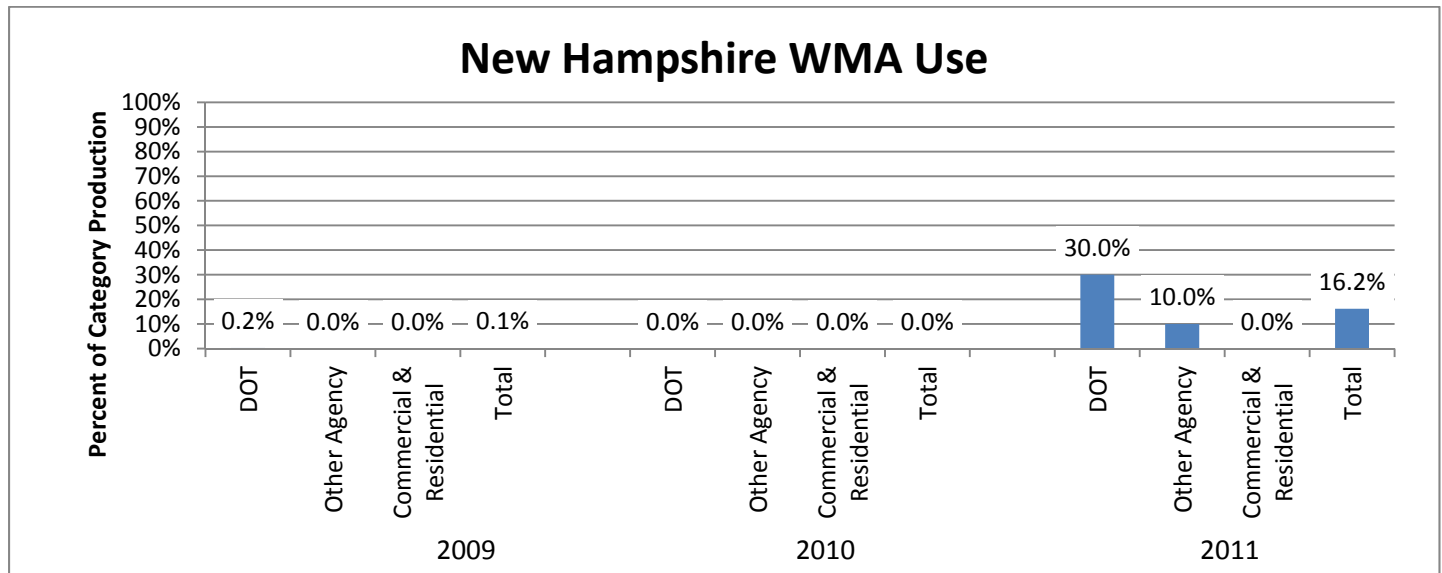


Table B 29: Summary of New Hampshire Data for 2011

Companies Reporting

1

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	366,923	784,843
Total Other Agency Tonnage	350,503	749,721
Total Commercial & Residential Tonnage	180,663	386,436
Total Tonnage	898,089	1,921,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	100,000	213,899
RAP Tons used in HMA/WMA	187,047	400,091
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	10,000	21,390
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	20%	
Average % RAP in Other Agency Mixes	22%	
Average % RAP in Commercial & Residential Mixes	22%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	100%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	250	535
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	1%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	110,077	235,453
WMA Other Agency Tonnage	35,050	74,972
WMA Commercial & Residential Tonnage	-	-
Total WMA Tonnage	145,127	310,425
Percent WMA Tons using Chemical Additives	20.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	80.0%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

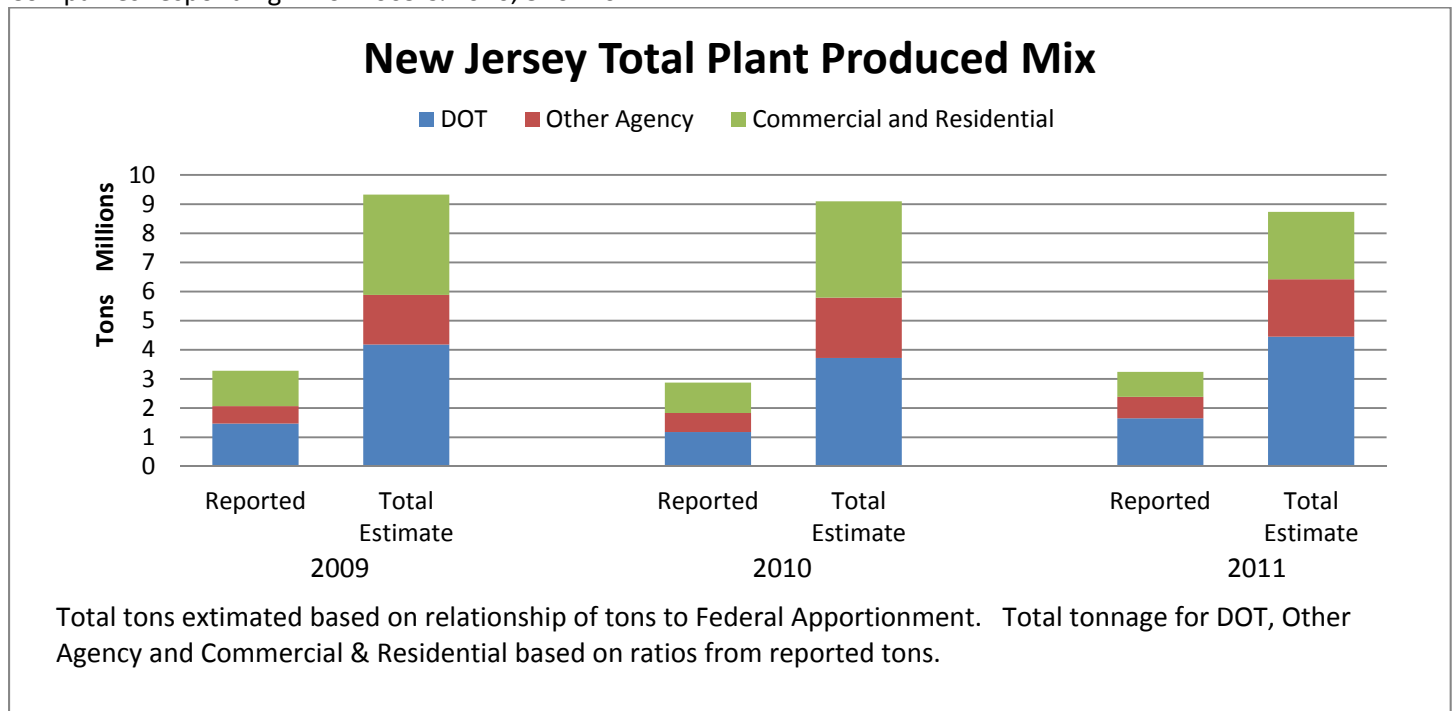


## New Jersey

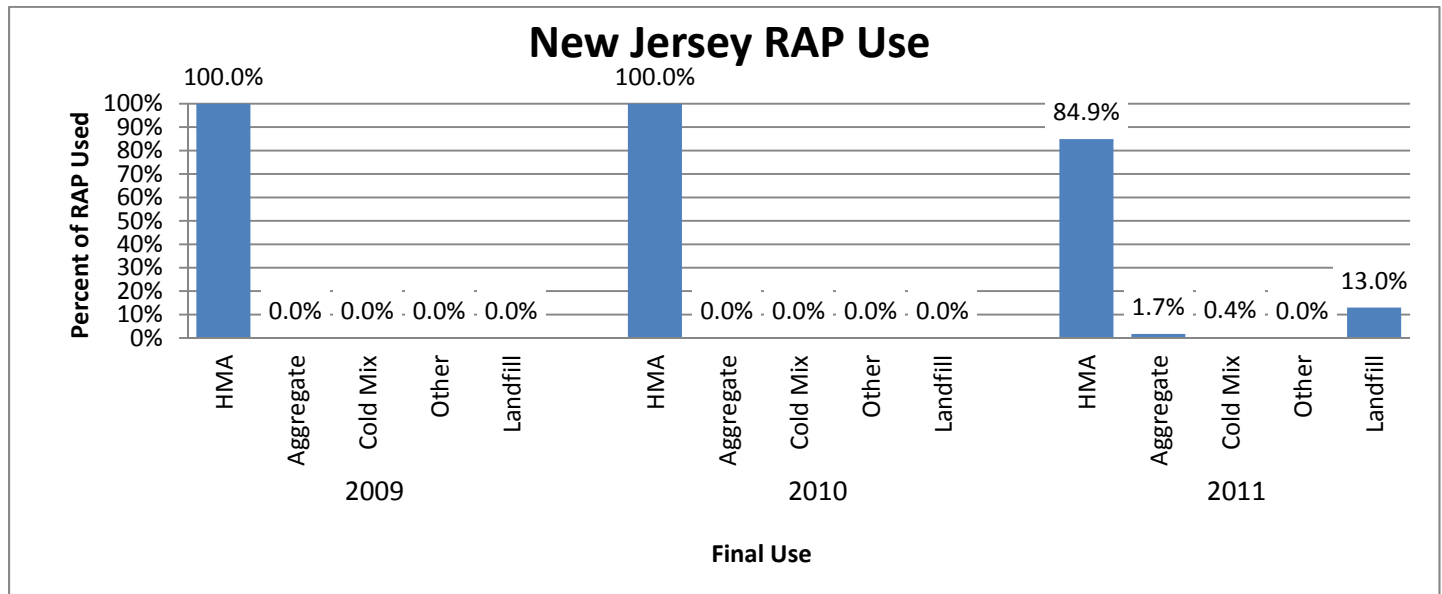
Table B31 summarizes the results received from asphalt mix producers in New Jersey. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 2 for 2009 & 2010, 3 for 2011



### RAP Use



### RAS Use

No contractors reported using RAS in 2009, 2010 or 2011.

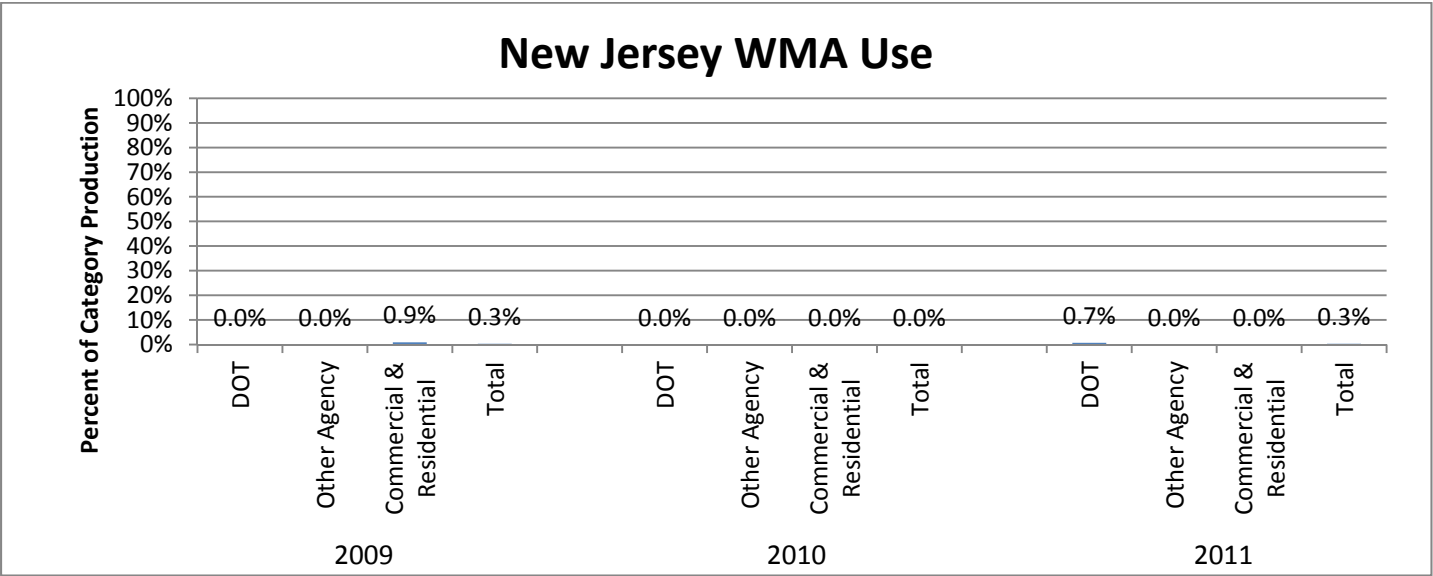


Table B 30: Summary of New Jersey Data for 2011

# New Jersey

Companies Reporting

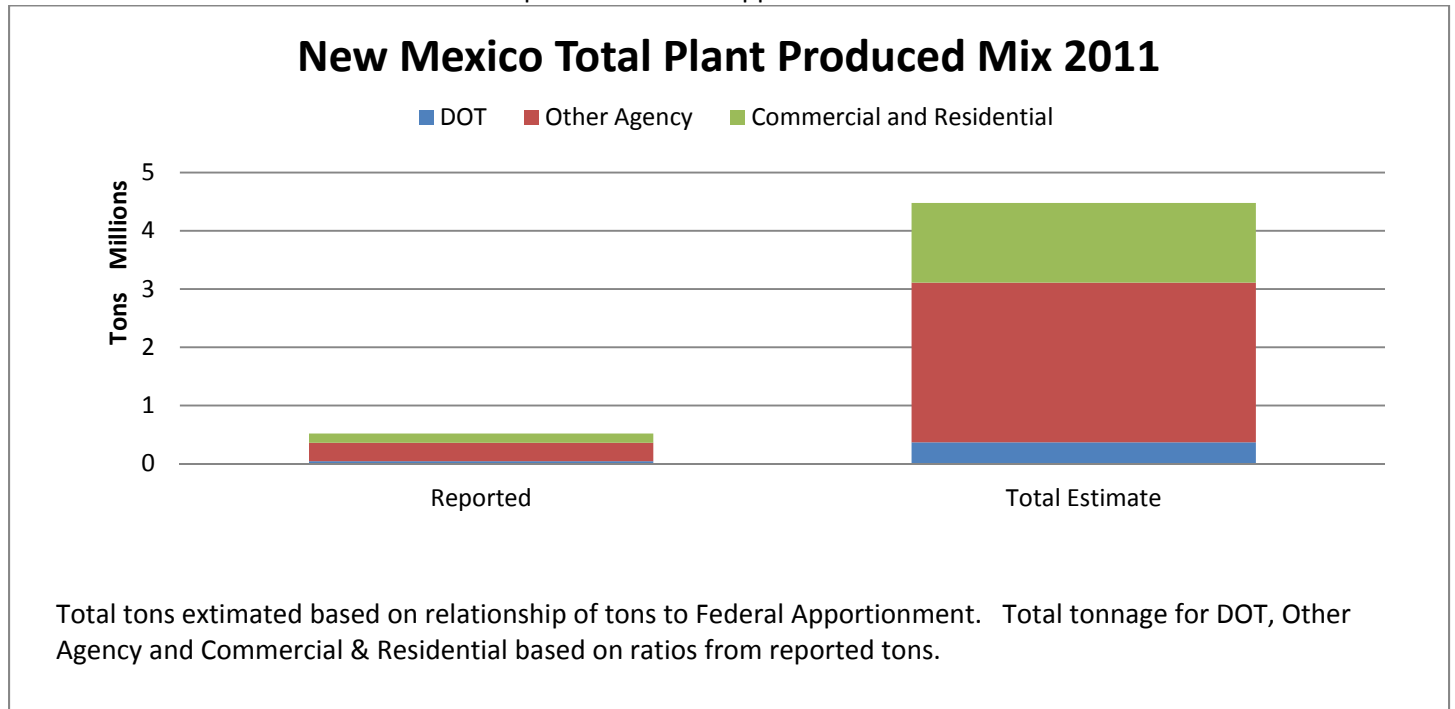
3

HMA/WMA		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,653,138	4,453,378
Total Other Agency Tonnage	730,905	1,968,980
Total Commercial & Residential Tonnage	857,733	2,310,642
Total Tonnage	3,241,776	8,733,000
Reclaimed Asphalt Pavement (RAP)		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	900,000	2,424,504
RAP Tons used in HMA/WMA	522,383	1,407,244
RAP Tons used as Aggregate	10,500	28,286
RAP Tons used in Cold Mix	2,500	6,735
RAP Tons used as Other	-	-
RAP Tons Landfilled	80,000	215,511
Average % RAP in DOT Mixes	14%	
Average % RAP in Other Agency Mixes	15%	
Average % RAP in Commercial & Residential Mixes	20%	
Reclaimed Asphalt Shingles (RAS)		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
Warm-Mix Asphalt		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	67%	
WMA DOT Tonnage	11,304	30,451
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	-	-
Total WMA Tonnage	11,304	30,451
Percent WMA Tons using Chemical Additives	75.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	25.0%	
Percent WMA Tons using Organic Additive	0.0%	

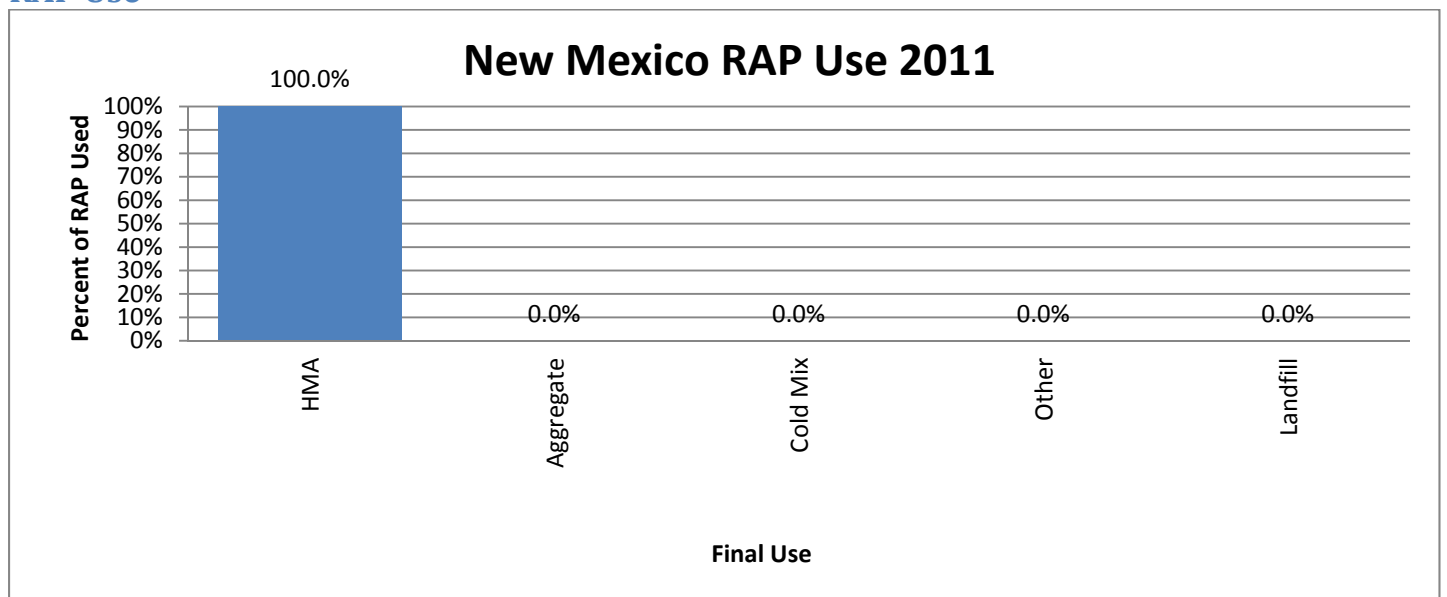
1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## New Mexico

No contractors submitted data for the New Mexico for 2009 and 2010. One contractor submitted data for 2011. Total tons were estimated based on a relationship tons to federal apportionment. Table B28 summarizes this data.



## RAP Use



## RAS Use

No companies in New Mexico responded to the 2009 and 2010 survey. No RAS use was reported in 2011

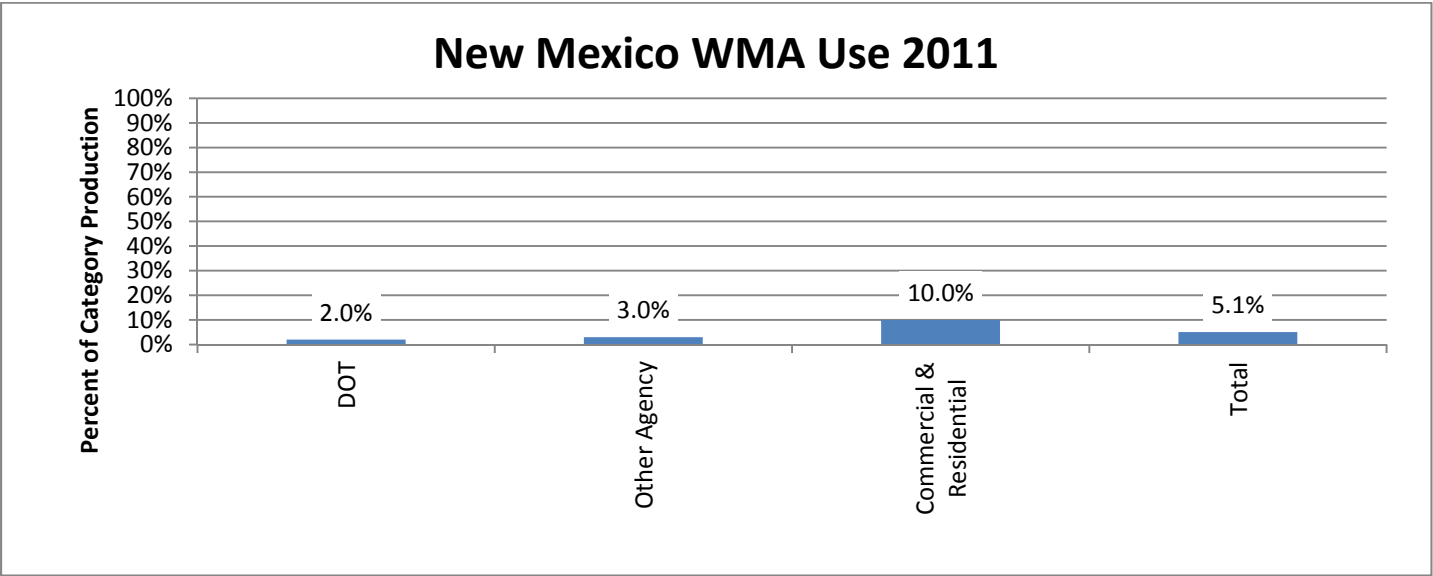


Table B 31: Summary New Mexico Data for 2011

Companies Reporting

1

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	42,424	367,350
Total Other Agency Tonnage	316,562	2,741,117
Total Commercial & Residential Tonnage	158,278	1,370,533
Total Tonnage	517,264	4,479,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	122,558	1,061,232
RAP Tons used in HMA/WMA	94,999	822,598
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	15%	
Average % RAP in Other Agency Mixes	18%	
Average % RAP in Commercial & Residential Mixes	20%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	848	7,347
WMA Other Agency Tonnage	9,497	82,234
WMA Commercial & Residential Tonnage	15,828	137,053
Total WMA Tonnage	26,173	226,634
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

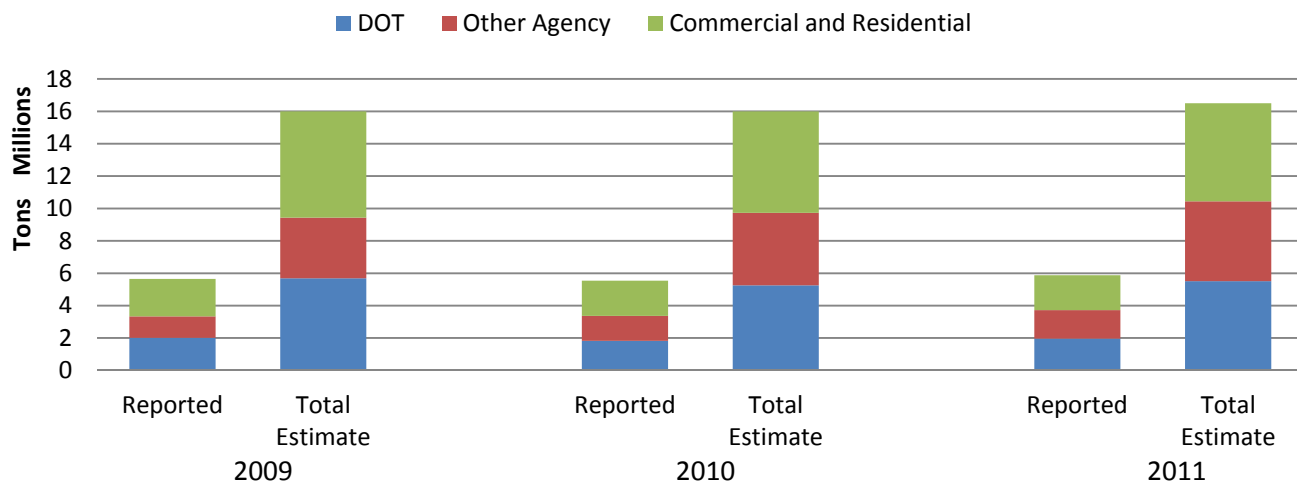
## New York

Table B33 summarizes the results received from asphalt mix producers in New York. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 13 for 2009 & 2010, 11 for 2011

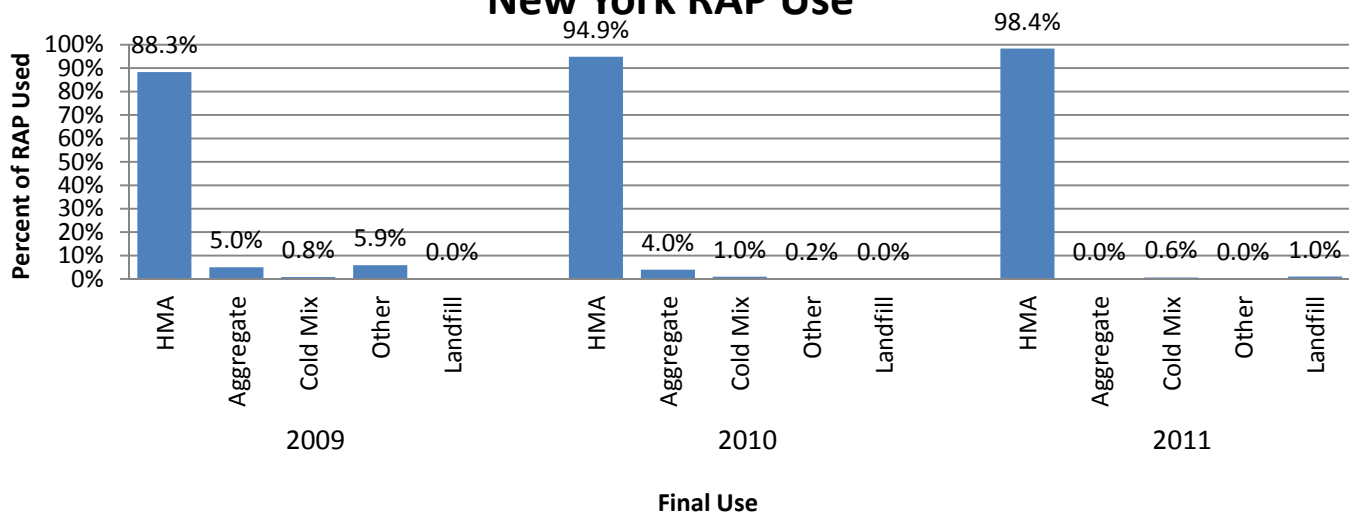
#### New York Total Plant Produced Mix



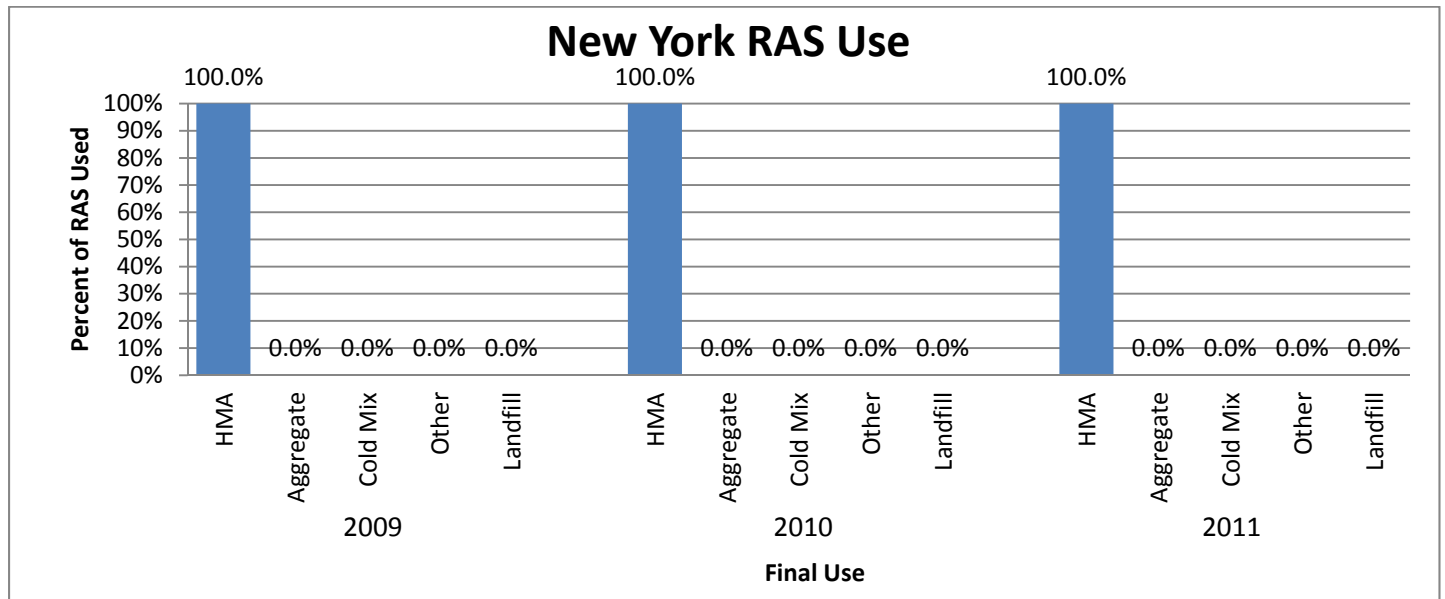
Total tonnage provided by the New York Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential based on ratios from reported tons.

### RAP Use

#### New York RAP Use



## RAS Use



## WMA Use

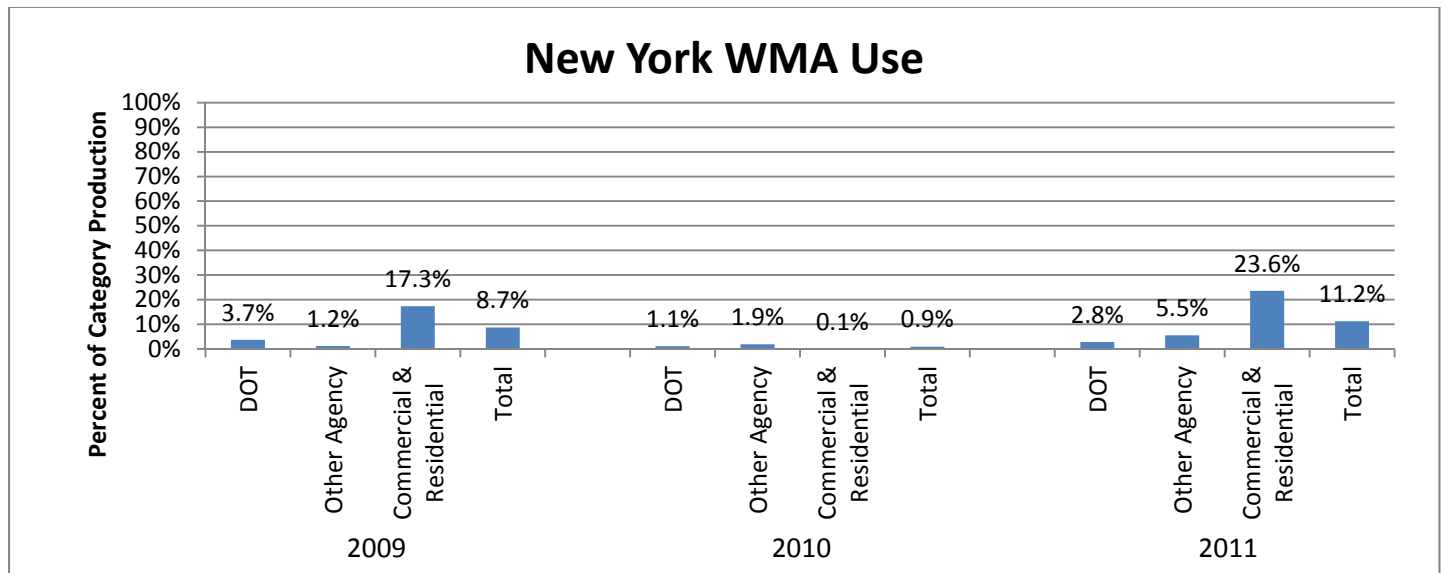




Table B 32: Summary of New York Data for 2011

Companies Reporting

11

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,964,351	5,515,549
Total Other Agency Tonnage	1,755,304	4,928,582
Total Commercial & Residential Tonnage	2,156,785	6,055,869
Total Tonnage	5,876,440	16,500,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	1,073,114	3,013,114
RAP Tons used in HMA/WMA	961,016	2,698,363
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	5,974	16,774
RAP Tons used as Other	-	-
RAP Tons Landfilled	10,000	28,078
Average % RAP in DOT Mixes	13%	
Average % RAP in Other Agency Mixes	20%	
Average % RAP in Commercial & Residential Mixes	18%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	9%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	2,000	5,616
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	73%	
WMA DOT Tonnage	54,675	153,518
WMA Other Agency Tonnage	96,960	272,246
WMA Commercial & Residential Tonnage	508,552	1,427,923
Total WMA Tonnage	660,187	1,853,687
Percent WMA Tons using Chemical Additives	15.1%	
Percent WMA Tons using Additive Foaming	1.1%	
Percent WMA Tons using Plant Foaming	83.7%	
Percent WMA Tons using Organic Additive	0.0%	

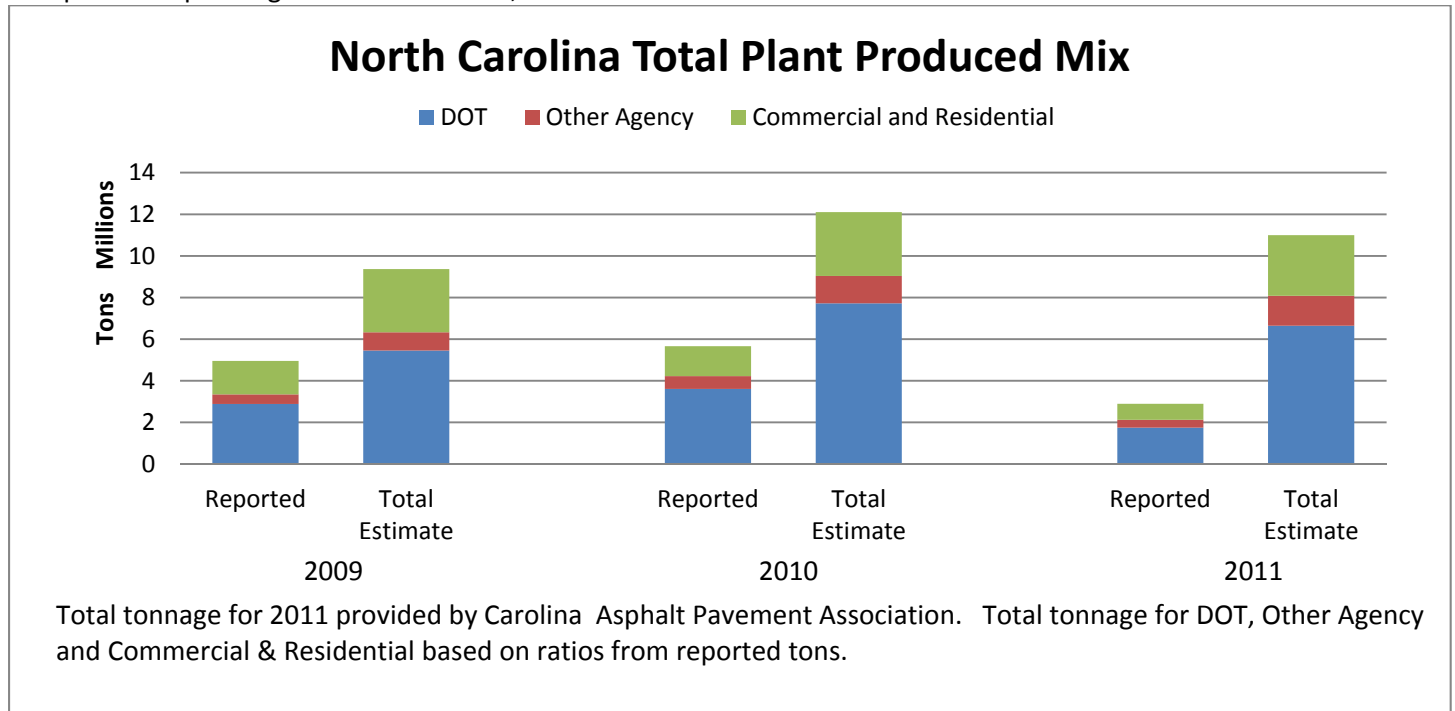
1. Total tonnage provided by the New York Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## North Carolina

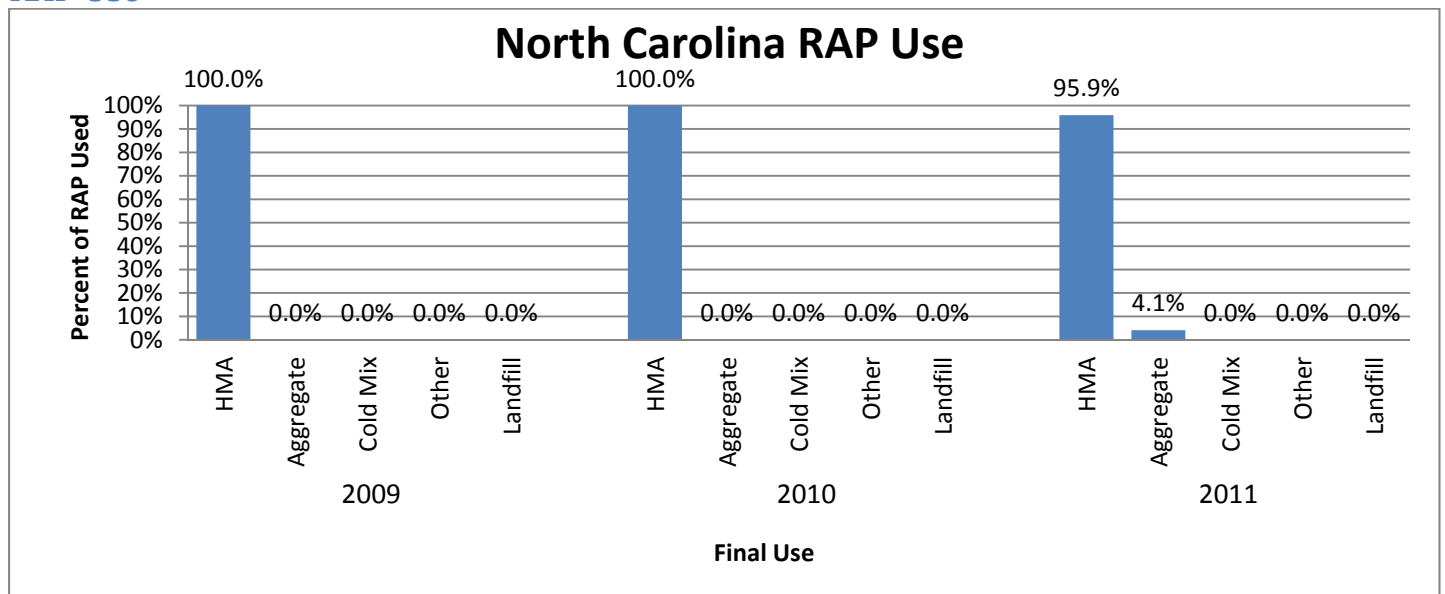
Table B34 summarizes the results received from asphalt mix producers in North Carolina. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

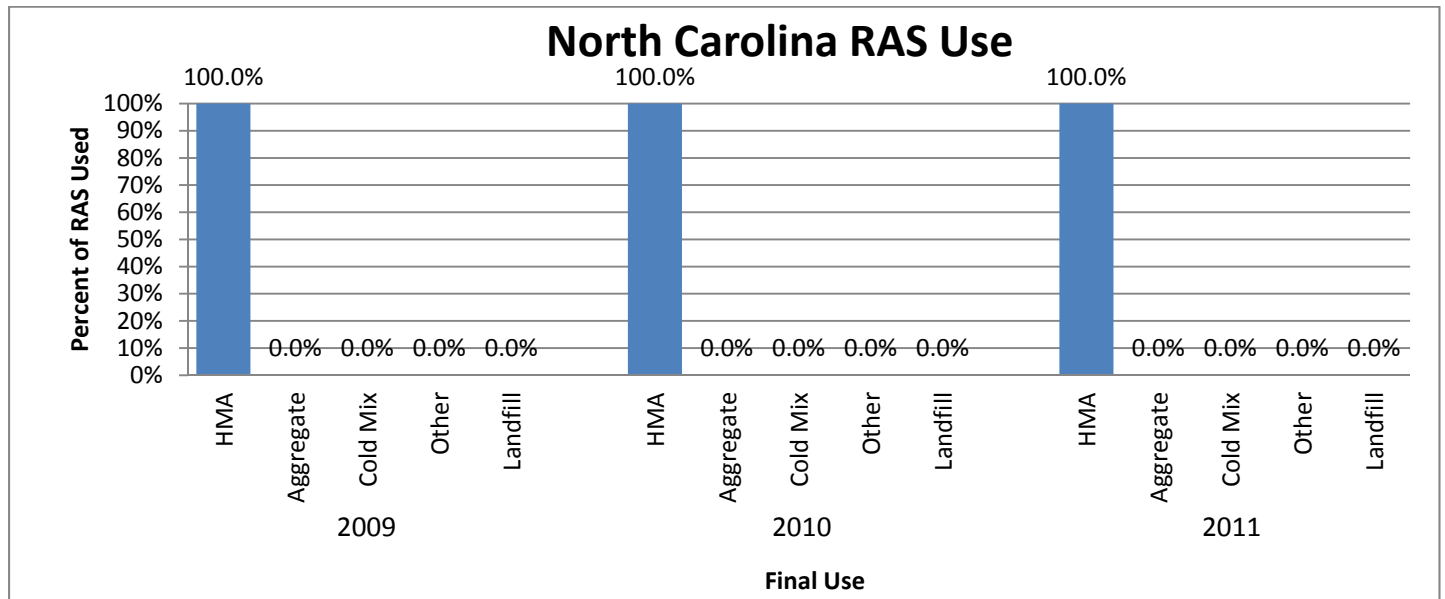
Companies responding: 6 for 2009 & 2010, 5 for 2011



### RAP Use



## RAS Use



## WMA Use

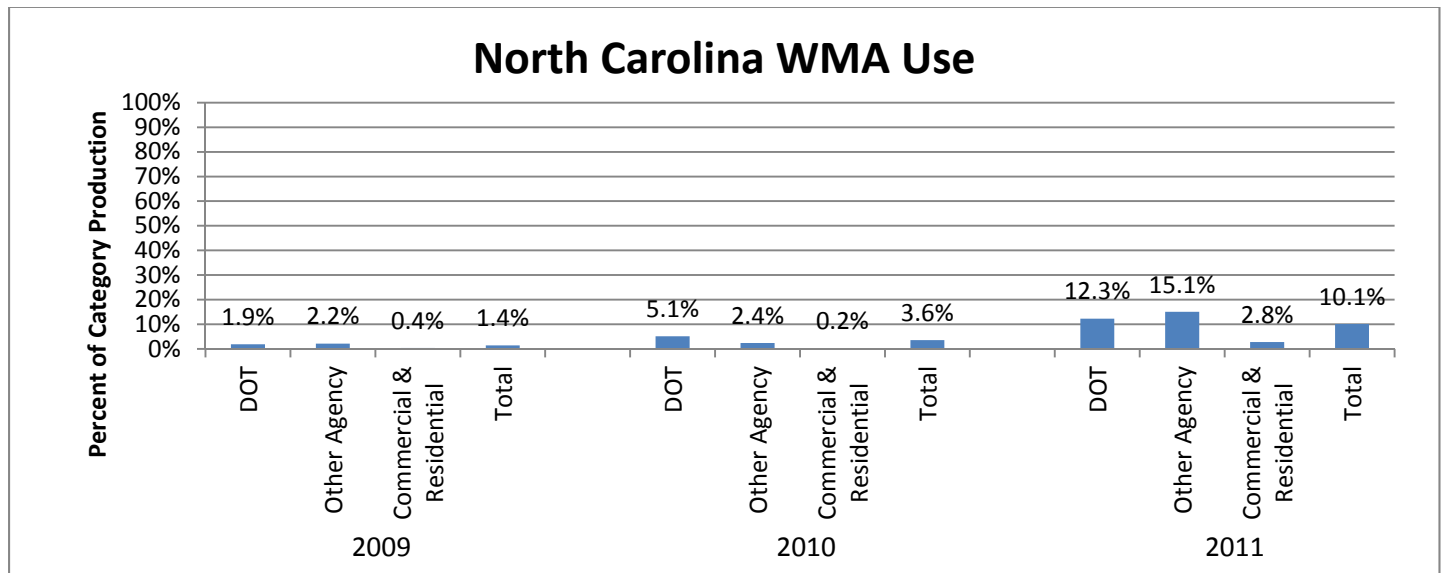


Table B 33: Summary of North Carolina Data for 2011

Companies Reporting

5

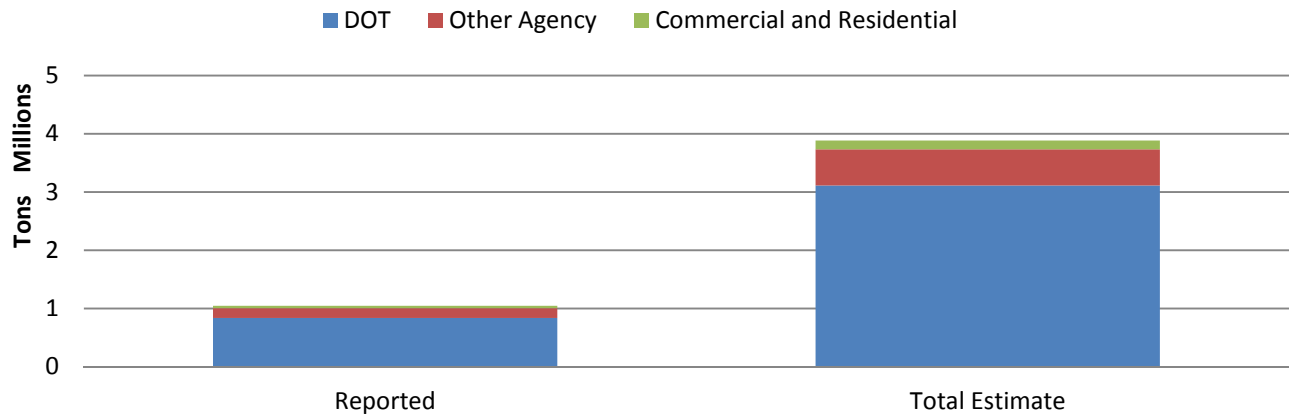
<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,751,519	6,648,957
Total Other Agency Tonnage	378,093	1,435,283
Total Commercial & Residential Tonnage	768,091	2,915,760
Total Tonnage	2,897,703	11,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	751,121	2,851,338
RAP Tons used in HMA/WMA	703,772	2,671,596
RAP Tons used as Aggregate	30,000	113,883
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	22%	
Average % RAP in Other Agency Mixes	26%	
Average % RAP in Commercial & Residential Mixes	26%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	60%	
RAS Tons Received	50,000	189,806
RAS Tons used in HMA/WMA	2,464	9,354
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	2%	
Average % RAS in Other Agency Mixes	1%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	215,131	816,663
WMA Other Agency Tonnage	57,000	216,378
WMA Commercial & Residential Tonnage	21,395	81,218
Total WMA Tonnage	293,527	1,114,259
Percent WMA Tons using Chemical Additives	4.4%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	95.6%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tonnage provided by Carolina Asphalt Pavement Association. Total tonnage for DOT Other Agency and Commercial & Residential ratios from reported tons.

## North Dakota

No contractors submitted data for the North Dakota for 2009 and 2010. Three contractors submitted data for 2011. Table B28 summarizes this data.

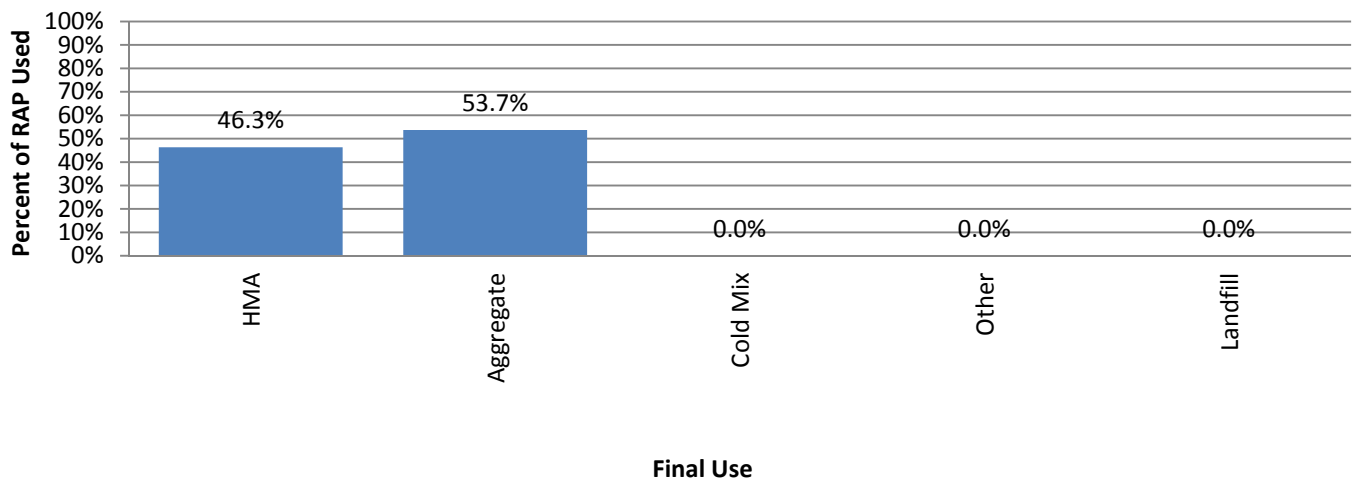
### North Dakota Total Plant Produced Mix 2011



Total tons Dakota Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential based on ratios from reported tons.

## RAP Use

### North Dakota RAP Use 2011



## RAS Use

No companies in North Dakota responded to the 2009 and 2010 survey. No RAS use was reported in 2011

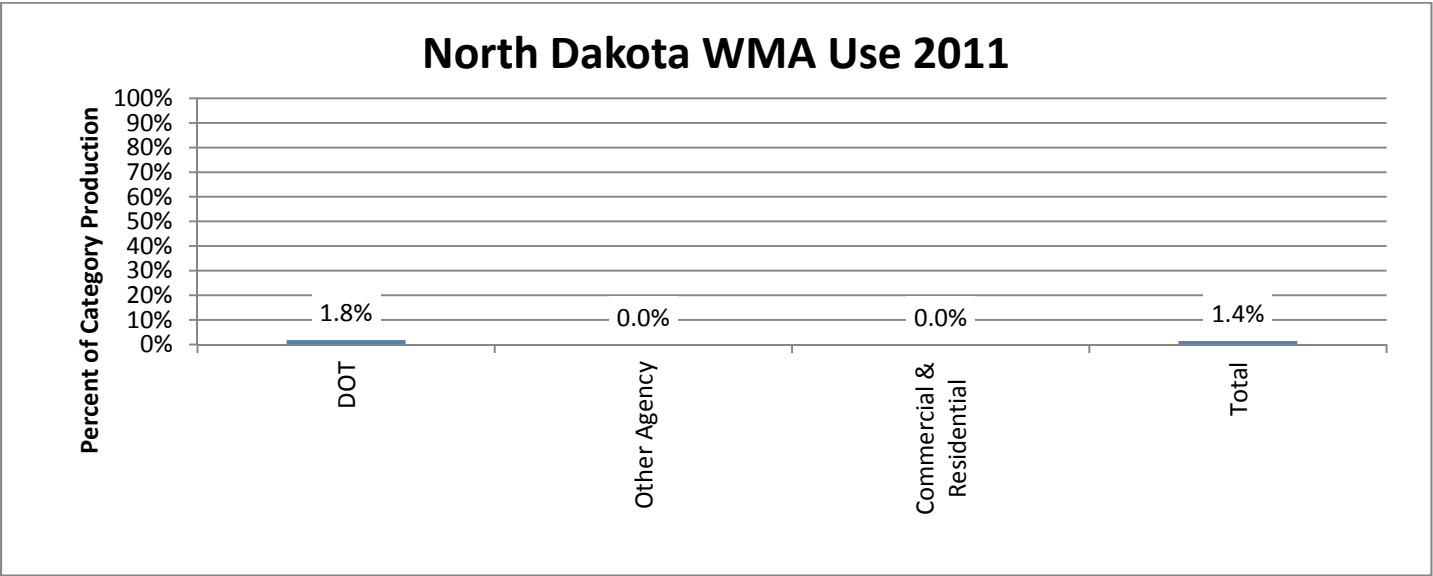


Table B 34: Summary of North Dakota Data for 2011

Companies Reporting

3

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	837,875	3,112,249
Total Other Agency Tonnage	167,464	622,038
Total Commercial & Residential Tonnage	40,844	151,713
Total Tonnage	1,046,183	3,886,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	67%	
RAP Tons Received	350,000	1,300,059
RAP Tons used in HMA/WMA	116,350	432,177
RAP Tons used as Aggregate	135,000	501,451
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	17%	
Average % RAP in Other Agency Mixes	12%	
Average % RAP in Commercial & Residential Mixes	24%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	33%	
RAS Tons Received	12,000	44,573
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	33%	
WMA DOT Tonnage	15,000	55,717
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	-	-
Total WMA Tonnage	15,000	55,717
Percent WMA Tons using Chemical Additives	100.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	0.0%	
Percent WMA Tons using Organic Additive	0.0%	

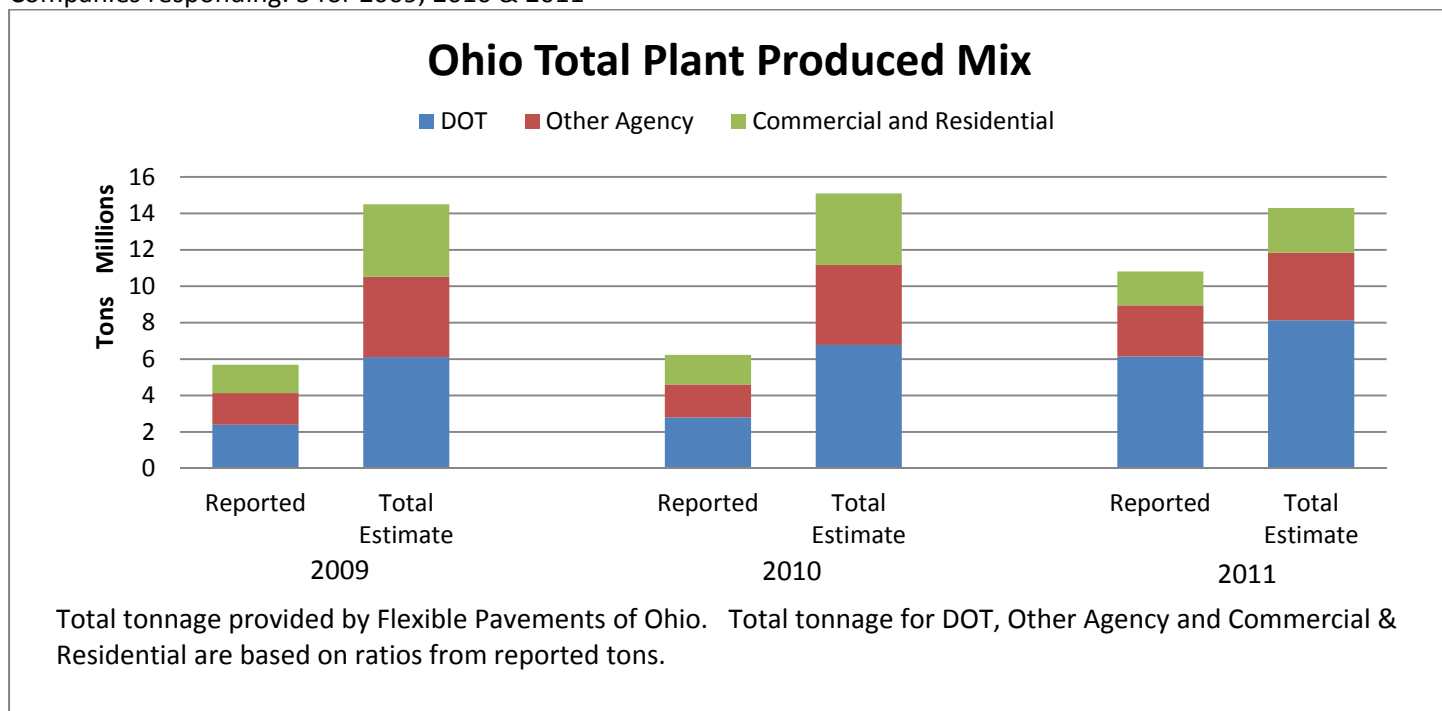
1. Total tons provided by the Dakota Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Ohio

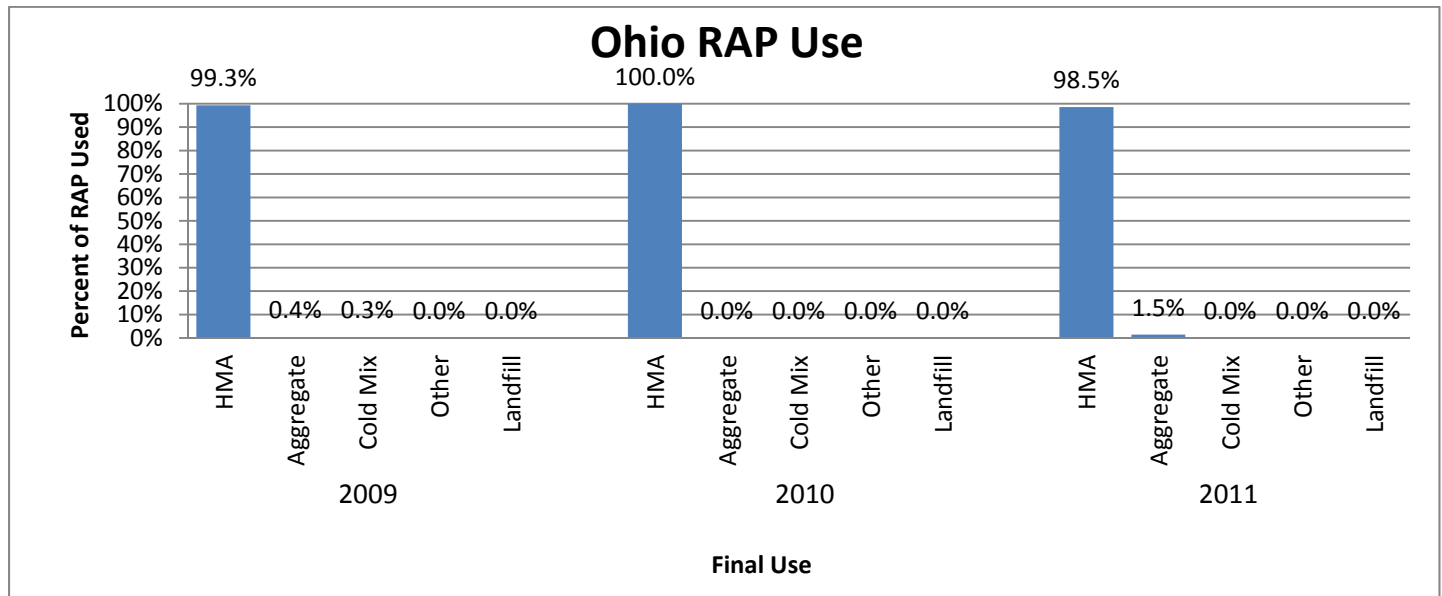
Table B36 summarizes the results received from asphalt mix producers in Ohio. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 5 for 2009, 2010 & 2011

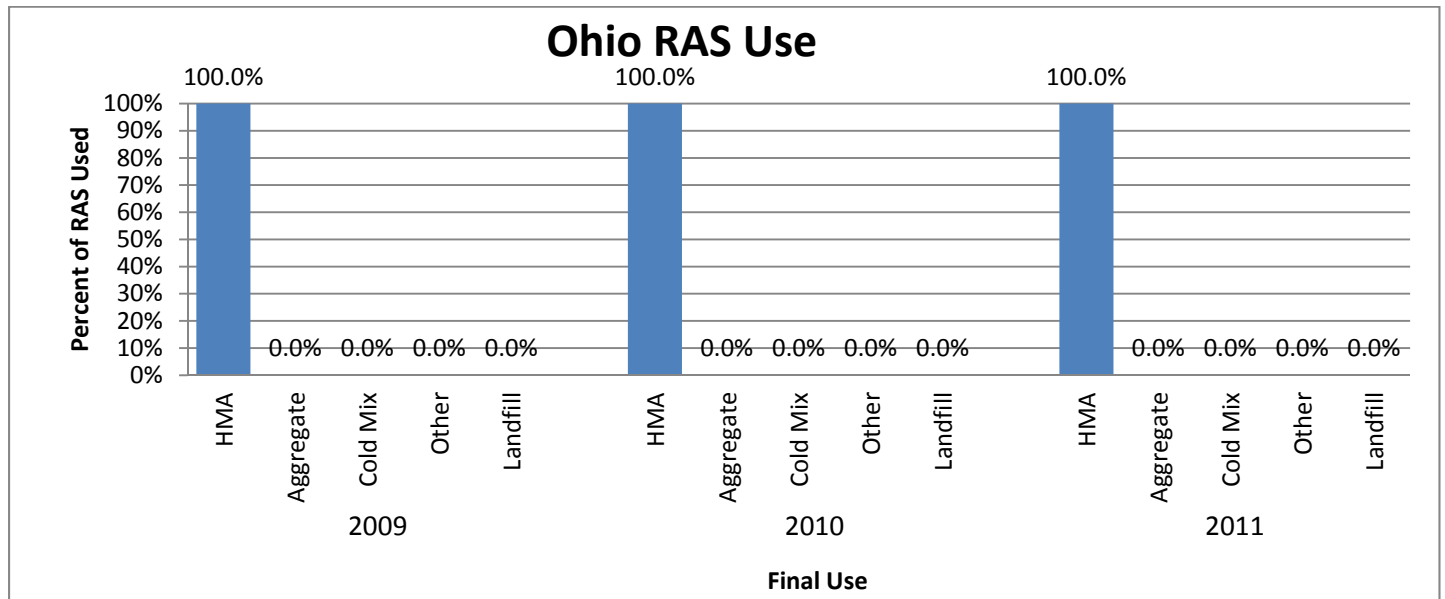


### RAP Use





## RAS Use



## WMA Use

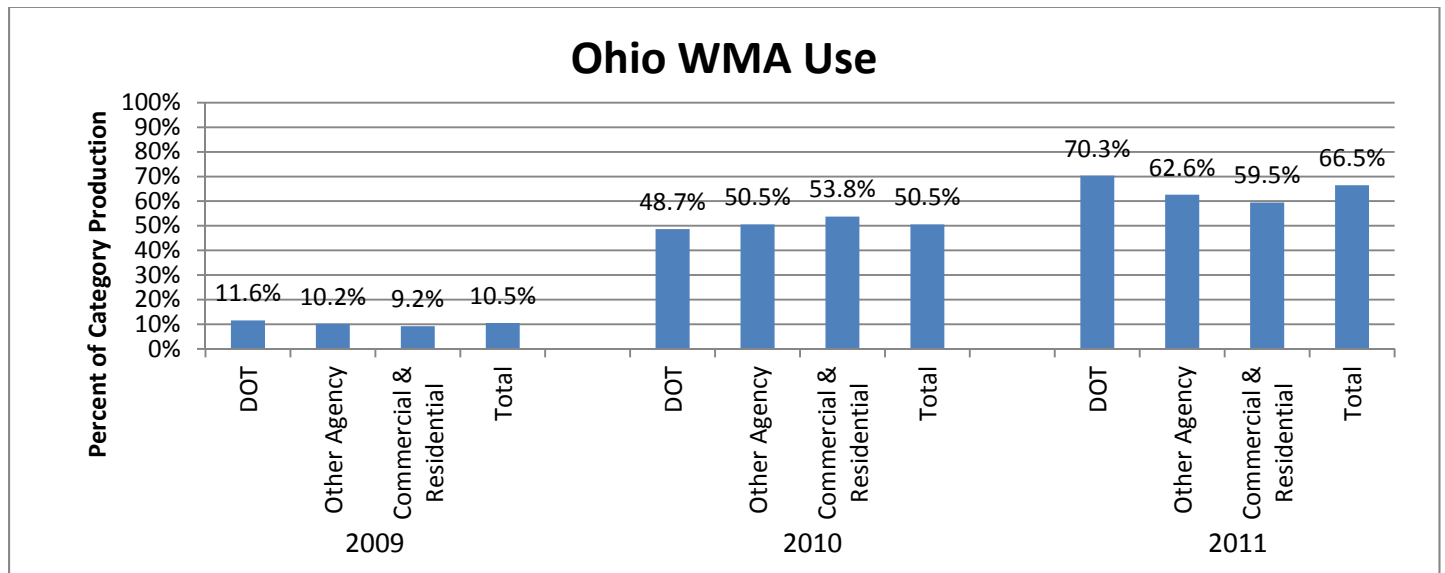


Table B 35: Summary of Ohio Data for 2011

Companies Reporting

5

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	6,149,416	8,132,633
Total Other Agency Tonnage	2,803,516	3,707,664
Total Commercial & Residential Tonnage	1,859,882	2,459,703
Total Tonnage	10,812,814	14,300,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	2,694,025	3,562,861
RAP Tons used in HMA/WMA	2,538,813	3,357,592
RAP Tons used as Aggregate	37,500	49,594
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	25%	
Average % RAP in Other Agency Mixes	23%	
Average % RAP in Commercial & Residential Mixes	26%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	40%	
RAS Tons Received	9,000	11,903
RAS Tons used in HMA/WMA	8,000	10,580
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	2%	
Average % RAS in Other Agency Mixes	3%	
Average % RAS in Commercial & Residential Mixes	3%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	80%	
WMA DOT Tonnage	4,324,761	5,719,517
WMA Other Agency Tonnage	1,755,167	2,321,216
WMA Commercial & Residential Tonnage	1,106,014	1,462,709
Total WMA Tonnage	7,185,941	9,503,442
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tonnage provided by Flexible Pavements of Ohio. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

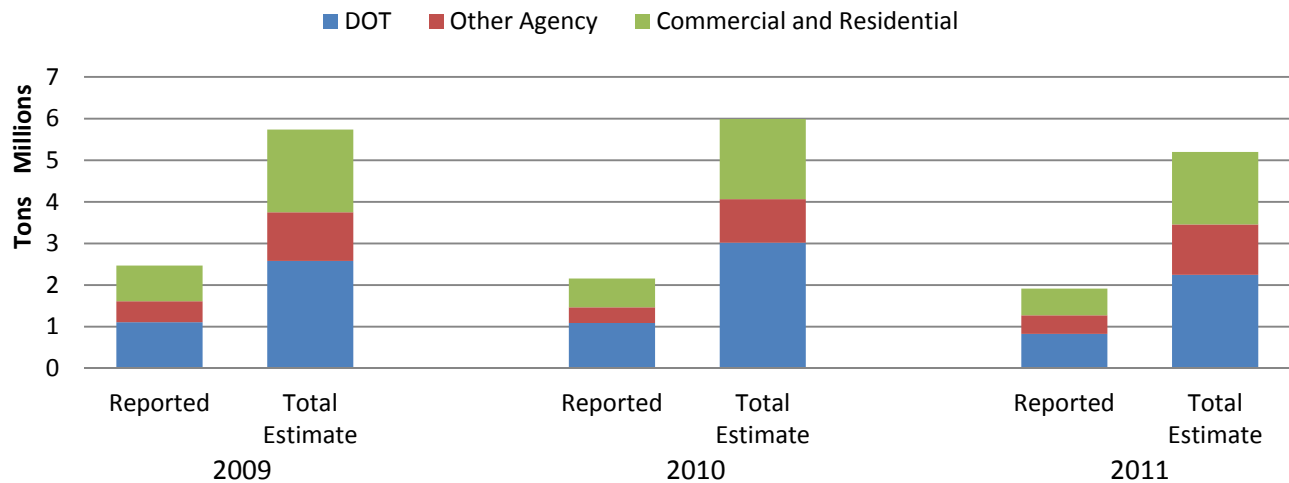
## Oklahoma

Table B37 summarizes the results received from asphalt mix producers in Oklahoma. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 4 for 2009 & 2010, 3 for 2011

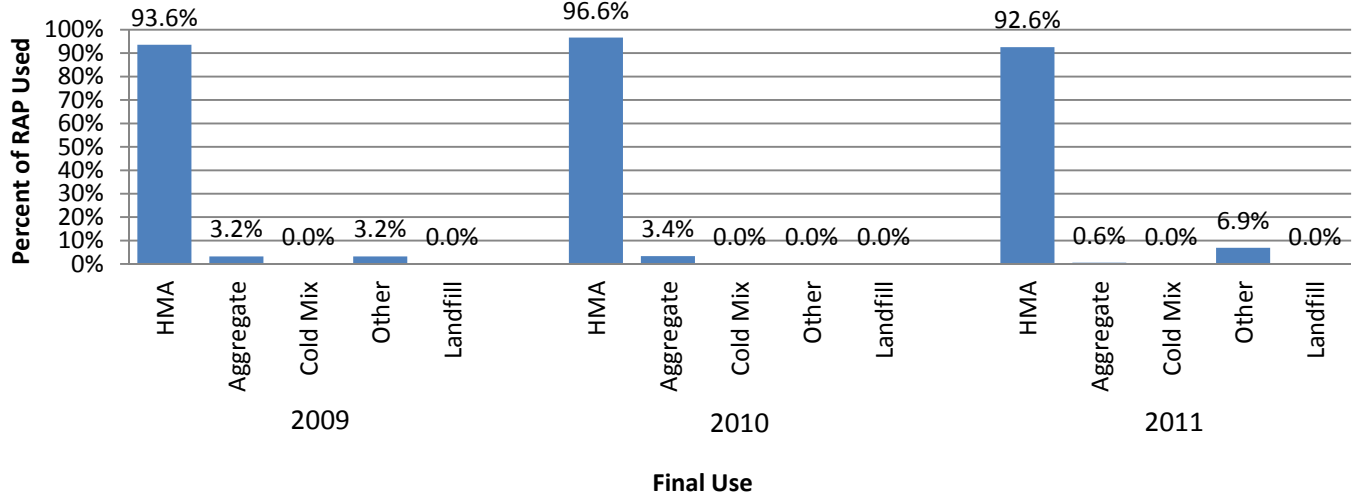
#### Oklahoma Total Plant Produced Mix



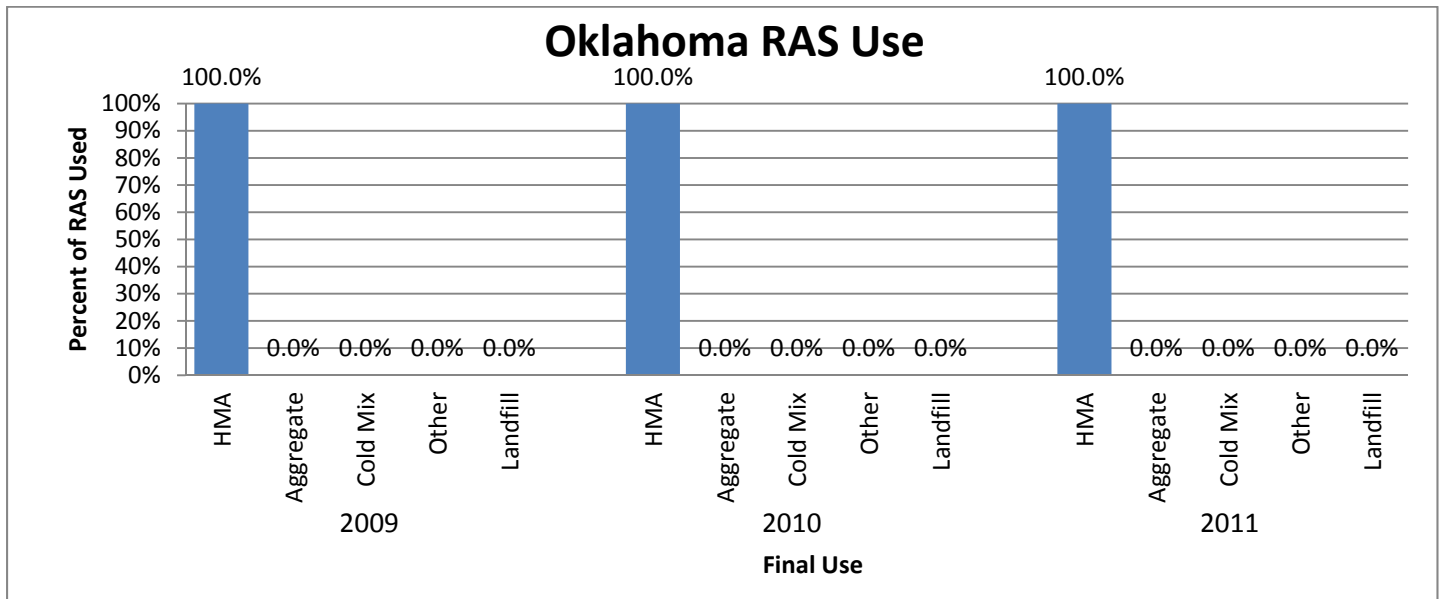
Total tons provided by the Oklahoma Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential based ratios from reported tons.

### RAP Use

#### Oklahoma RAP Use



## RAS Use



## WMA Use

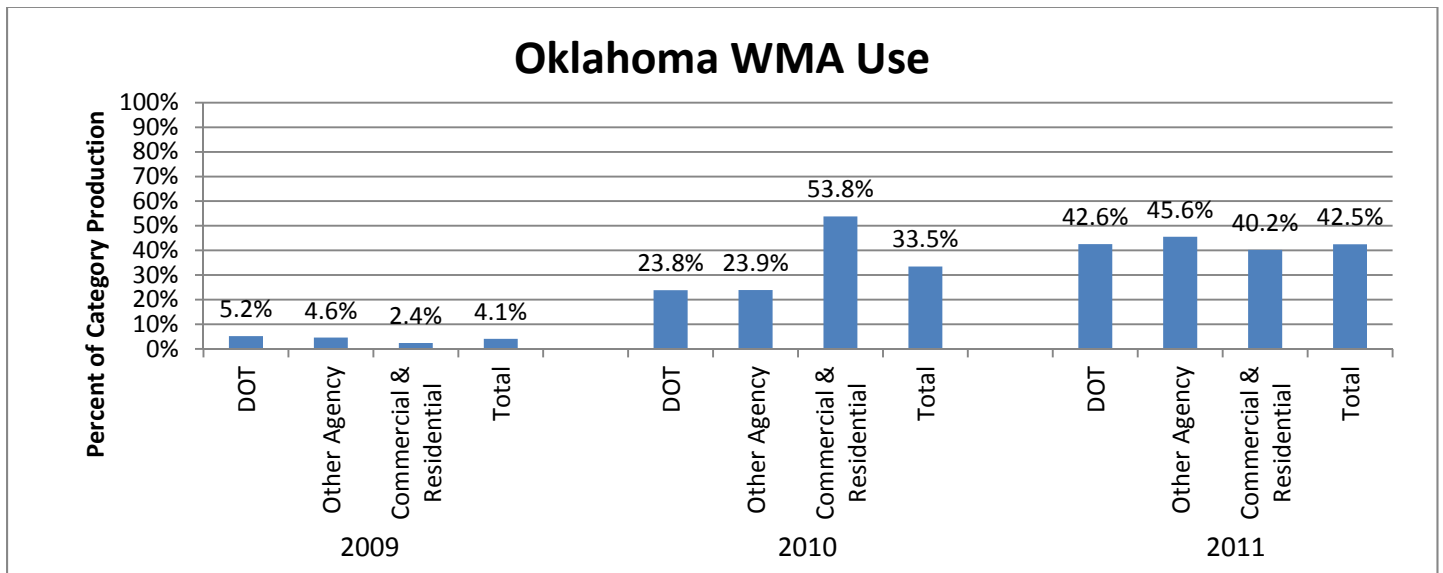


Table B 36: Summary of Oklahoma Data for 2011

Companies Reporting

3

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	828,000	2,248,623
Total Other Agency Tonnage	445,000	1,208,499
Total Commercial & Residential Tonnage	641,772	1,742,878
Total Tonnage	1,914,772	5,200,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	522,490	1,418,941
RAP Tons used in HMA/WMA	335,803	911,950
RAP Tons used as Aggregate	2,000	5,431
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	25,000	67,893
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	16%	
Average % RAP in Other Agency Mixes	14%	
Average % RAP in Commercial & Residential Mixes	15%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	100%	
RAS Tons Received	79,700	216,444
RAS Tons used in HMA/WMA	18,905	51,341
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	3%	
Average % RAS in Commercial & Residential Mixes	2%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	352,500	957,294
WMA Other Agency Tonnage	202,750	550,614
WMA Commercial & Residential Tonnage	257,943	700,503
Total WMA Tonnage	813,193	2,208,411
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

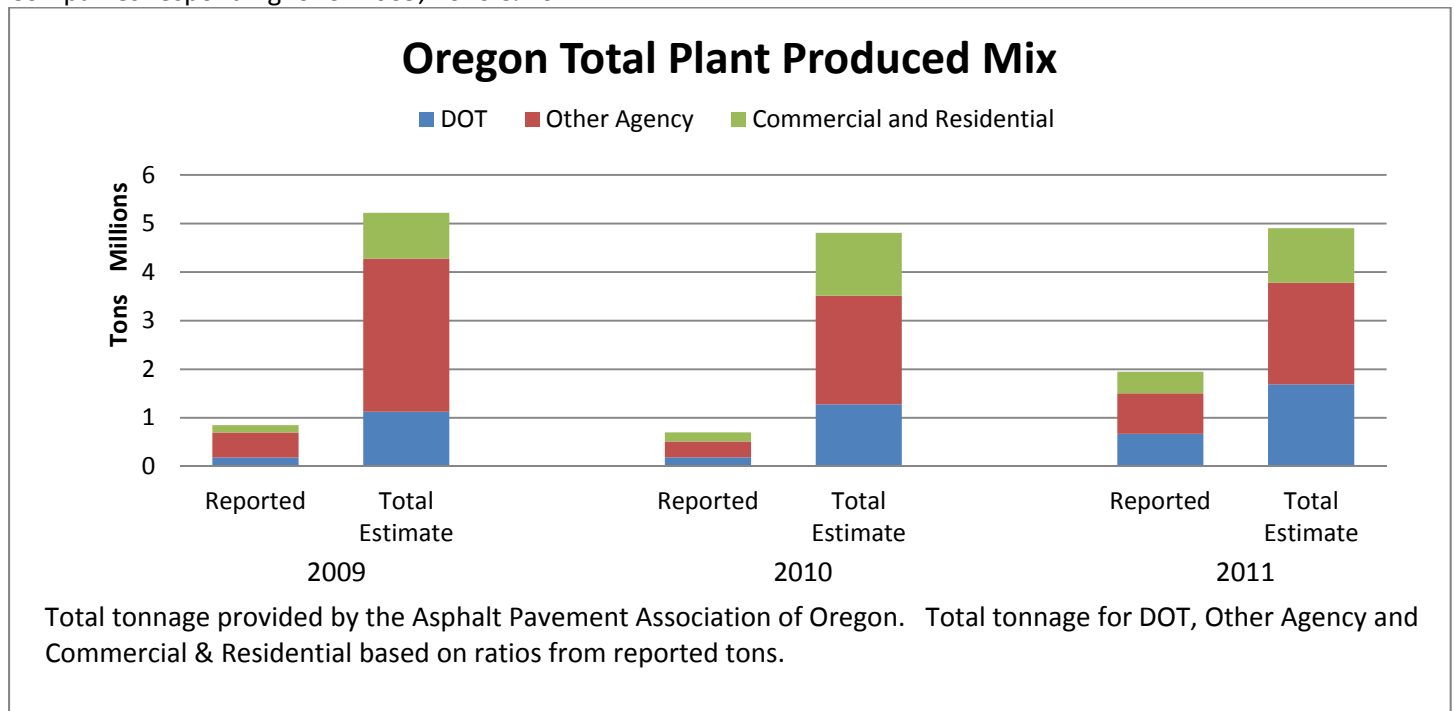
1. Total tons provided by Oklahoma Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Oregon

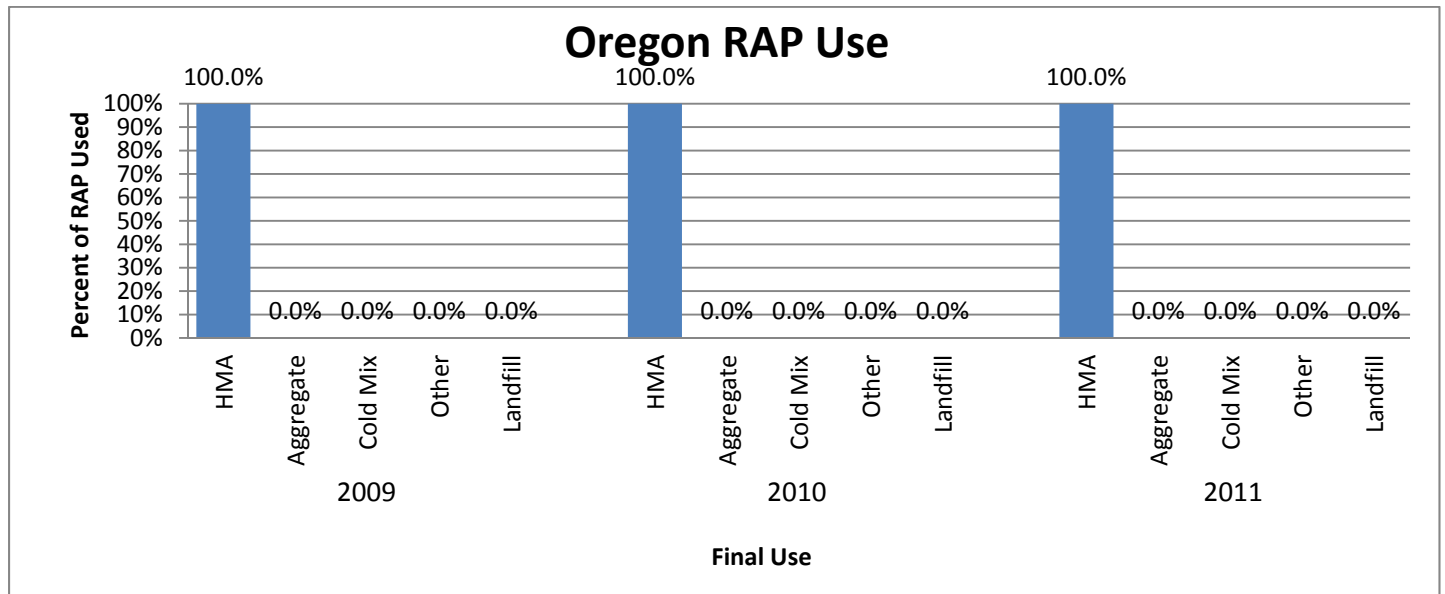
Table B38 summarizes the results received from asphalt mix producers in Oregon. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

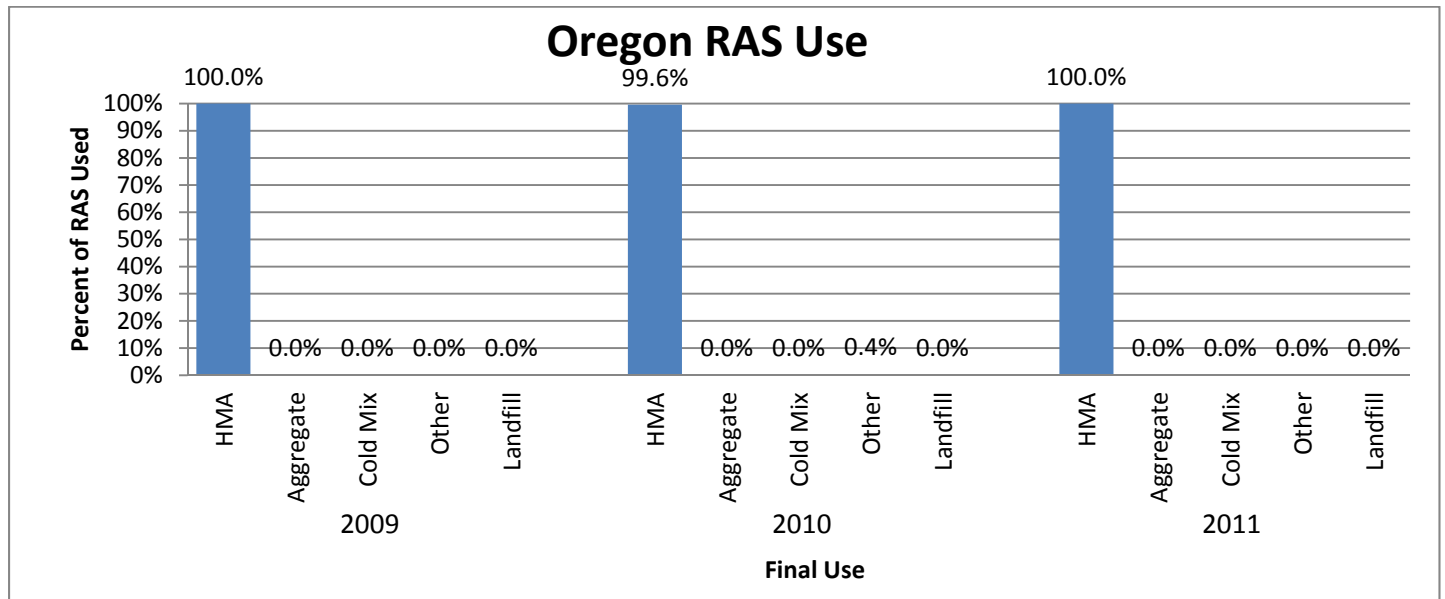
Companies responding: 6 for 2009, 2010 & 2011



### RAP Use



## RAS Use



## WMA Use

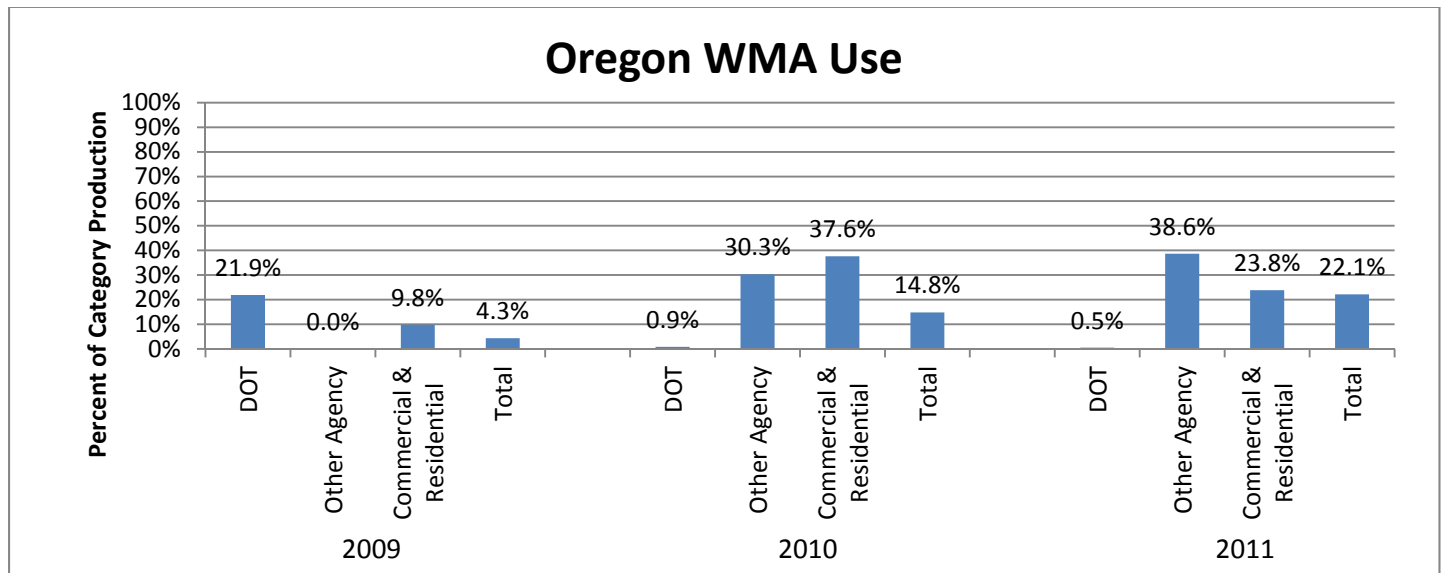


Table B 37: Summary of Oregon Data for 2011

Companies Reporting

6

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	671,243	1,688,437
Total Other Agency Tonnage	831,889	2,092,524
Total Commercial & Residential Tonnage	446,865	1,124,039
Total Tonnage	1,949,997	4,905,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	665,302	1,673,493
RAP Tons used in HMA/WMA	459,351	1,155,447
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	23%	
Average % RAP in Other Agency Mixes	27%	
Average % RAP in Commercial & Residential Mixes	25%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	33%	
RAS Tons Received	2,001	5,033
RAS Tons used in HMA/WMA	1,626	4,090
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	2%	
Average % RAS in Commercial & Residential Mixes	3%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	3,306	8,315
WMA Other Agency Tonnage	321,505	808,710
WMA Commercial & Residential Tonnage	106,492	267,869
Total WMA Tonnage	431,303	1,084,895
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	99.4%	
Percent WMA Tons using Organic Additive	0.6%	

1. Total tonnage provided by the Asphalt Pavement Association of Oregon. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

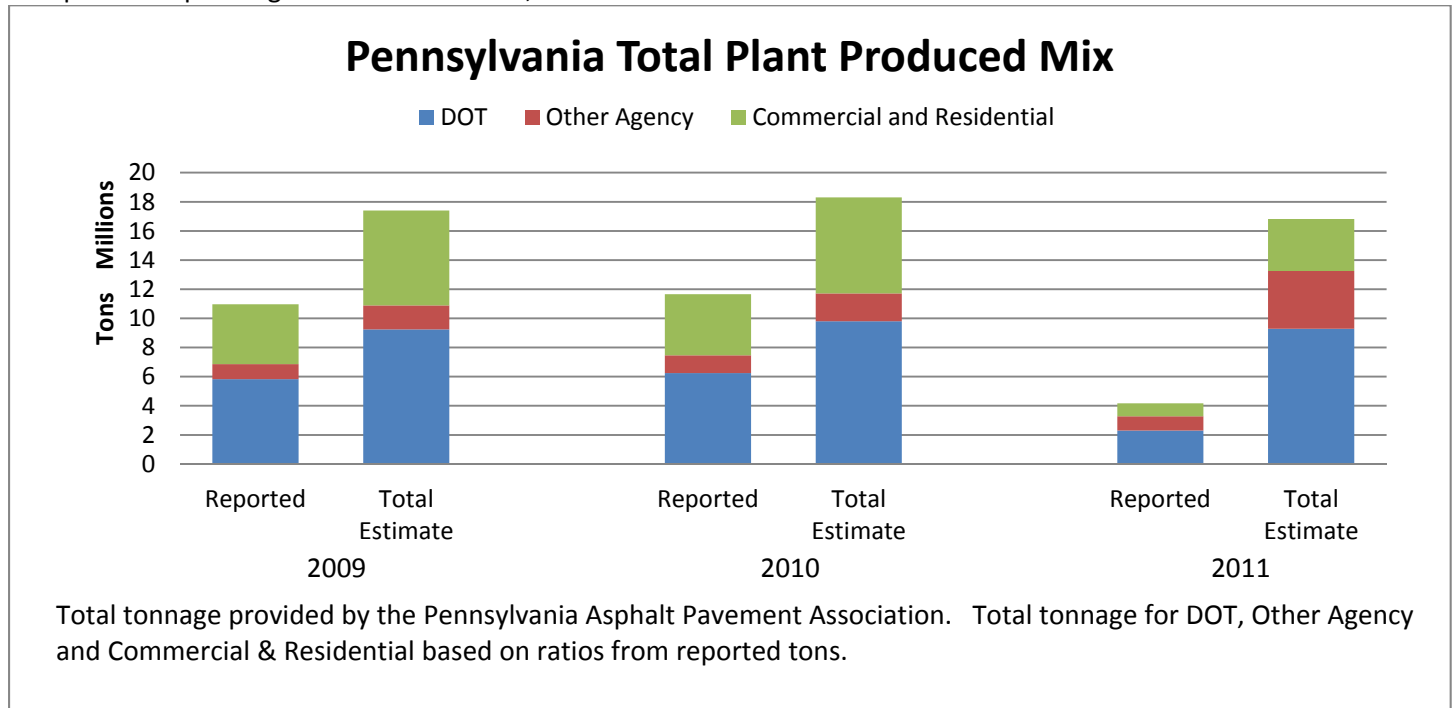


## Pennsylvania

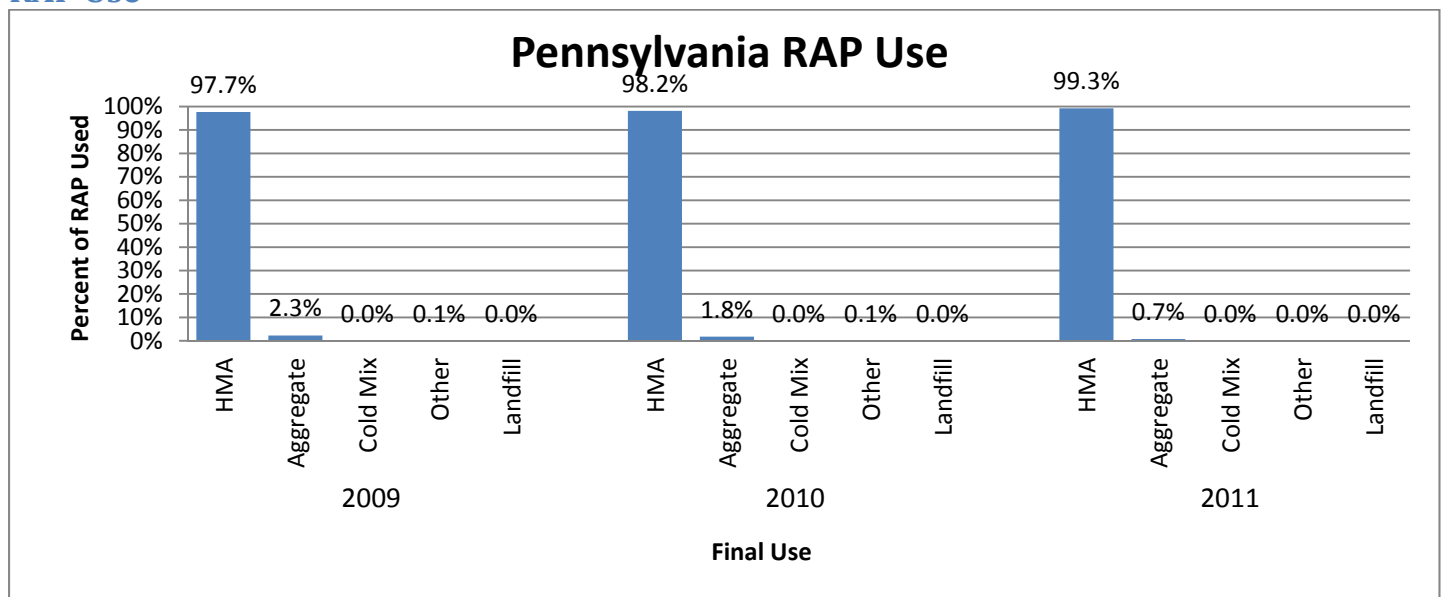
Table B38 summarizes the results received from asphalt mix producers in Pennsylvania. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

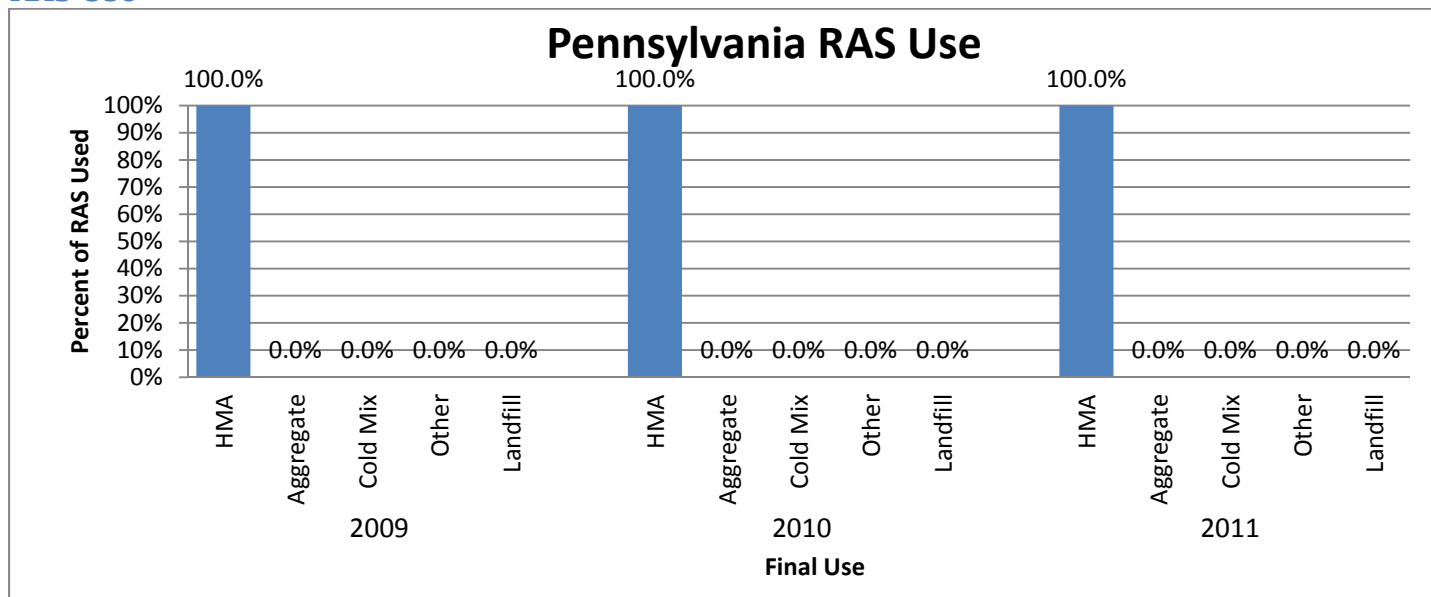
Companies responding: 17 for 2009 & 2010, 7 for 2011



### RAP Use



## RAS Use



## WMA Use

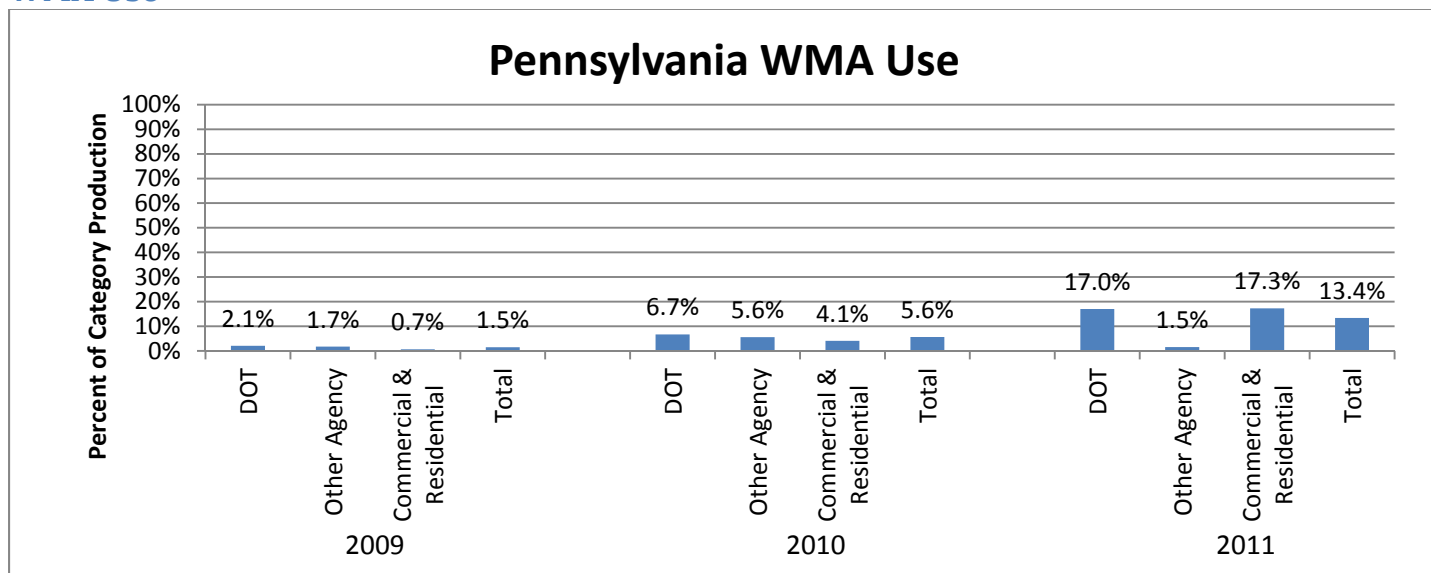


Table B 38: Summary of Pennsylvania Data for 2011

Companies Reporting

7

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	2,300,804	9,287,511
Total Other Agency Tonnage	982,126	3,964,488
Total Commercial & Residential Tonnage	885,143	3,573,001
Total Tonnage	4,168,073	16,825,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	297,872	1,202,401
RAP Tons used in HMA/WMA	665,525	2,686,484
RAP Tons used as Aggregate	5,001	20,187
RAP Tons used in Cold Mix	1	4
RAP Tons used as Other	1	4
RAP Tons Landfilled	1	4
Average % RAP in DOT Mixes	16%	
Average % RAP in Other Agency Mixes	7%	
Average % RAP in Commercial & Residential Mixes	20%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	57%	
RAS Tons Received	20,500	82,751
RAS Tons used in HMA/WMA	14,000	56,513
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	3%	
Average % RAS in Other Agency Mixes	1%	
Average % RAS in Commercial & Residential Mixes	1%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	390,880	1,577,839
WMA Other Agency Tonnage	15,137	61,102
WMA Commercial & Residential Tonnage	152,817	616,865
Total WMA Tonnage	558,833	2,255,806
Percent WMA Tons using Chemical Additives	30.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	70.0%	
Percent WMA Tons using Organic Additive	0.0%	

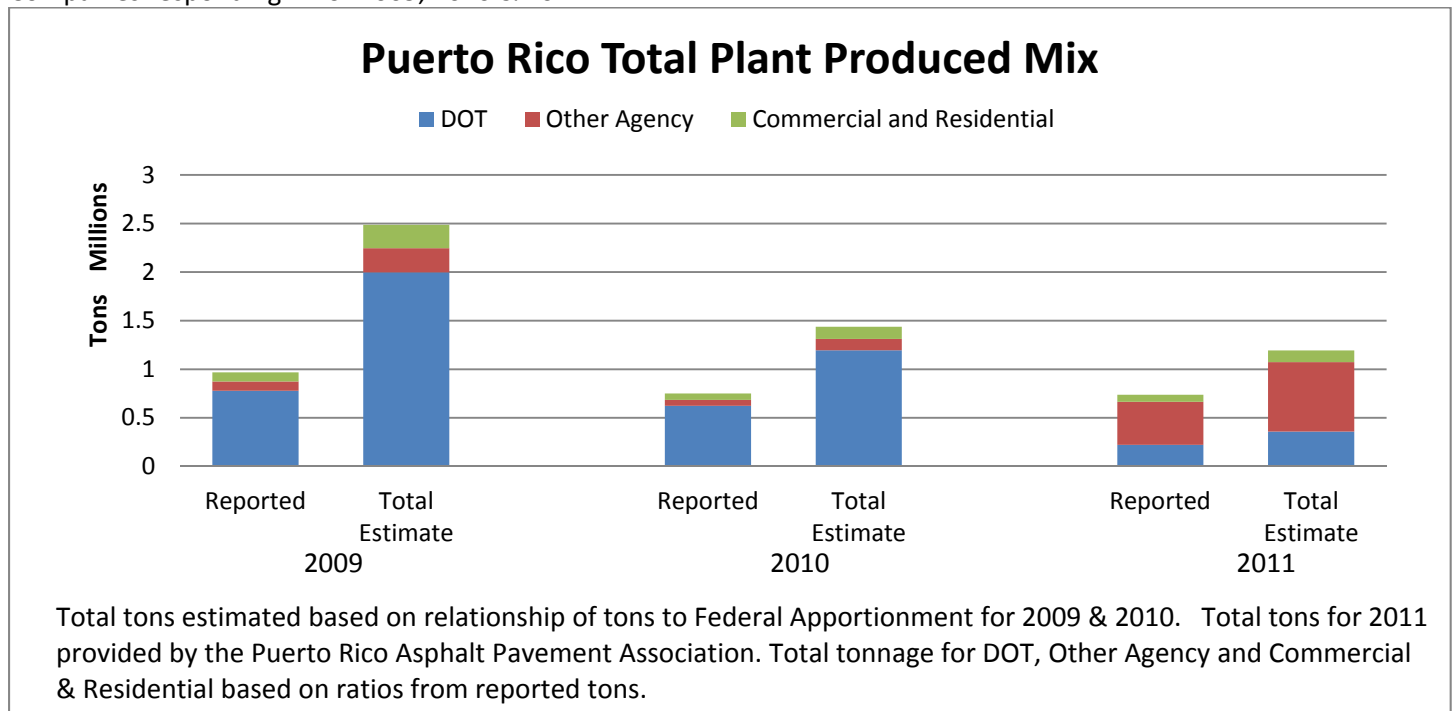
1. Total tonnage provided by the Pennsylvania Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Puerto Rico

Table B40 summarizes the results received from asphalt mix producers in Puerto Rico. The charts are used to summarize statistics calculated from information provided by the survey respondents.

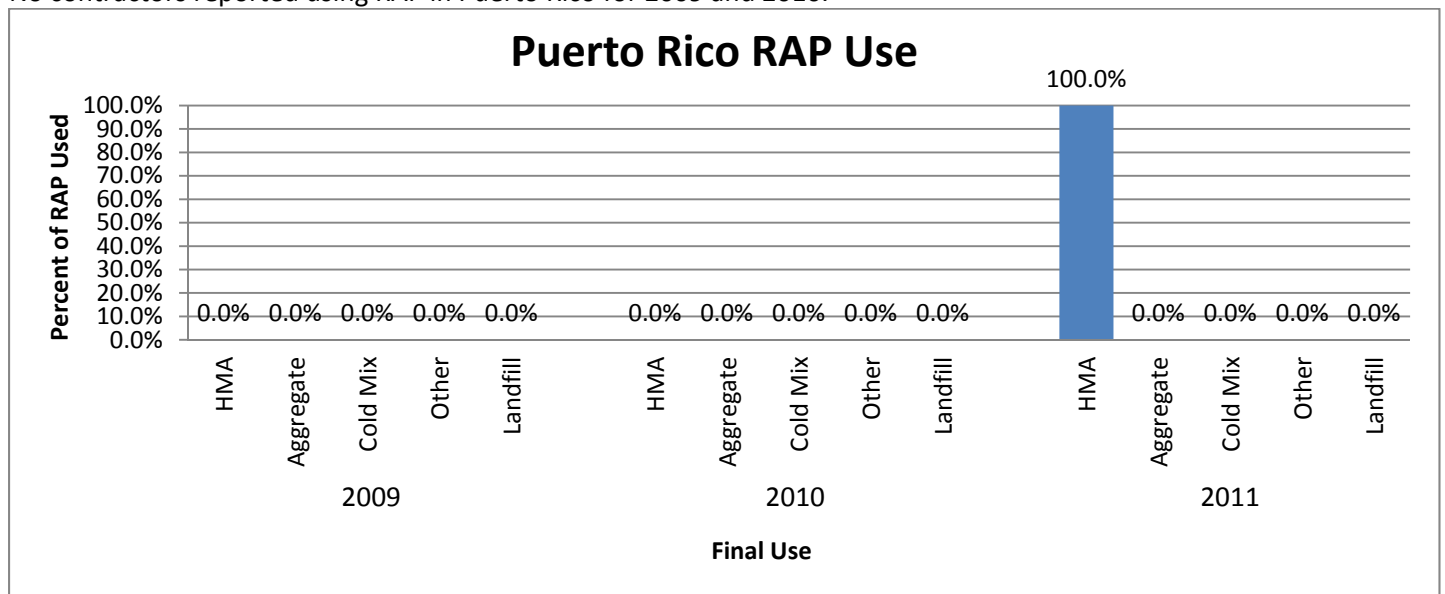
### Total Asphalt Mix Tonnage

Companies responding: 1 for 2009, 2010 & 2011



### RAP Use

No contractors reported using RAP in Puerto Rico for 2009 and 2010.



### RAS Use

No contractors reported using RAS in Puerto Rico for 2009, 2010 or 2011.

## WMA Use

No contractors reported using WMA in Puerto Rico for 2009 and 2010.

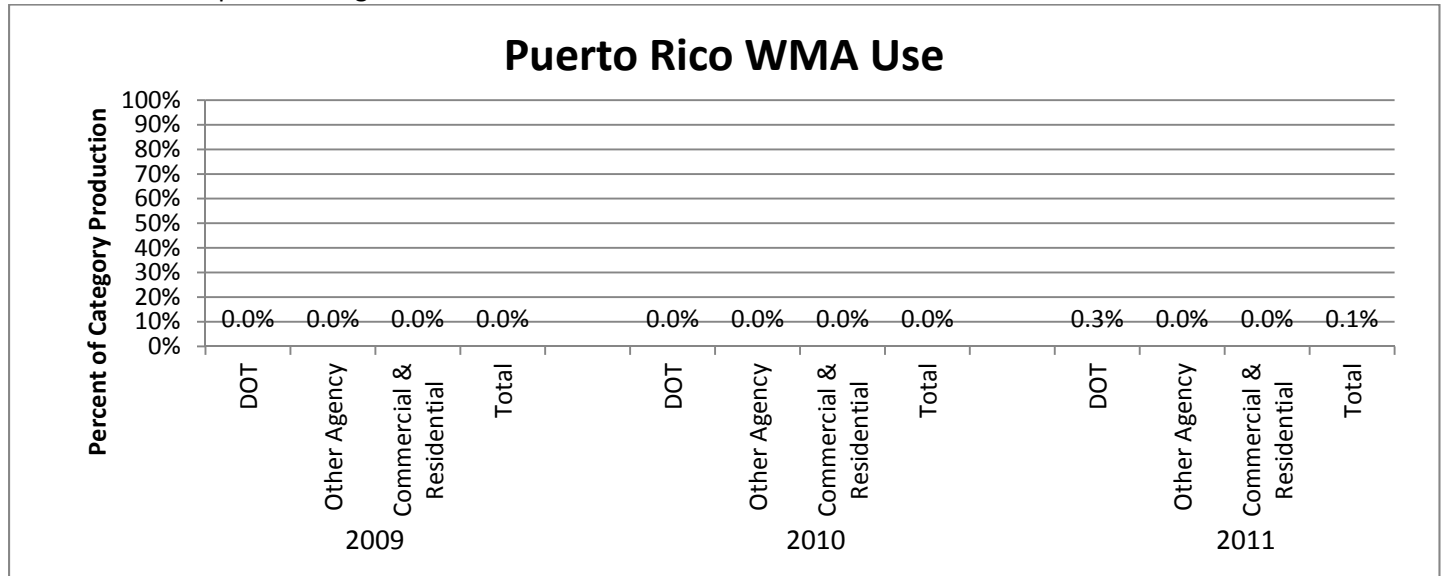


Table B 39: Summary of Puerto Rico Data for 2011

Companies Reporting

1

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	221,400	357,900
Total Other Agency Tonnage	442,800	715,800
Total Commercial & Residential Tonnage	73,800	119,300
Total Tonnage	738,000	1,193,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	63,000	101,841
RAP Tons used in HMA/WMA	13,500	21,823
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	5%	
Average % RAP in Other Agency Mixes	0%	
Average % RAP in Commercial & Residential Mixes	10%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	664	1,074
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	-	-
Total WMA Tonnage	664	1,074
Percent WMA Tons using Chemical Additives	100.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	0.0%	
Percent WMA Tons using Organic Additive	0.0%	

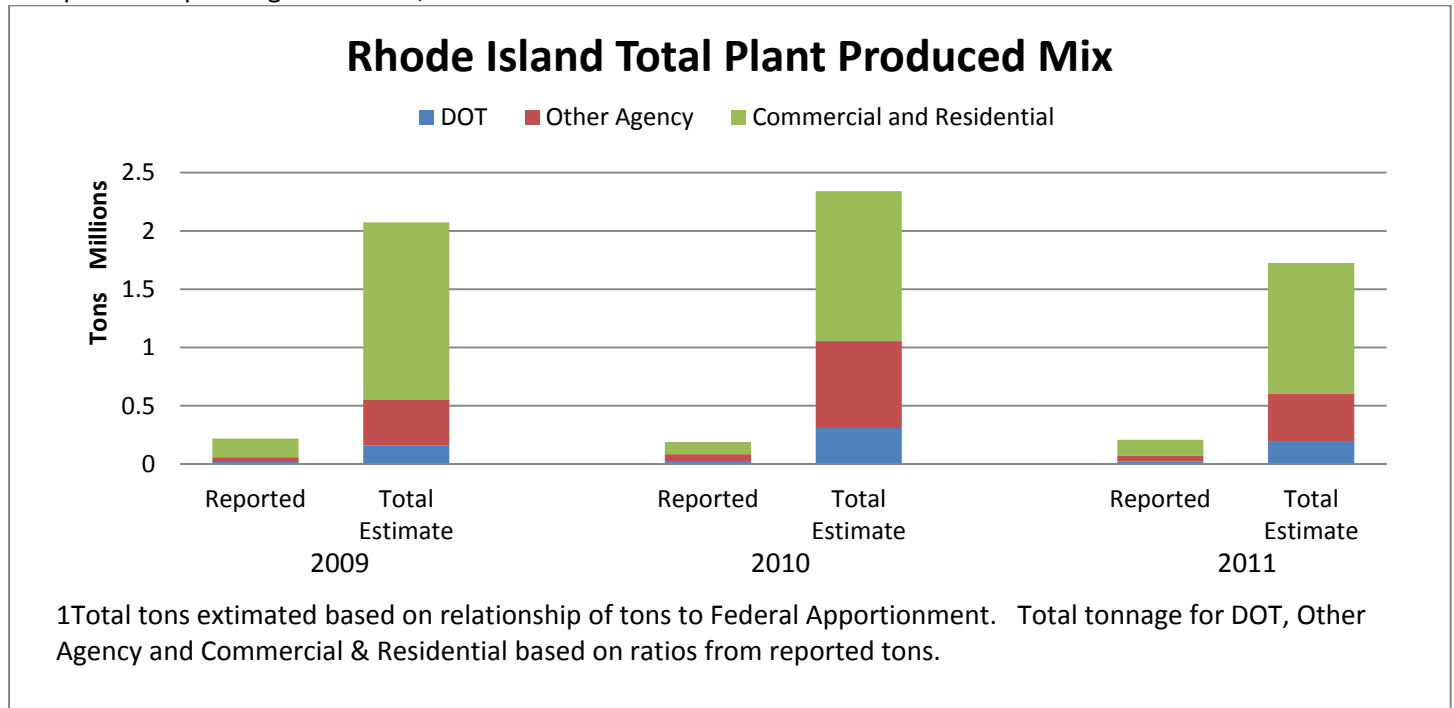
1. Total tons estimated based on relationship of tons to Federal Apportionment for 2009 & 2010. Total tons for 2011 provided by the Puerto Rico Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential based on ratios from reported tons.

## Rhode Island

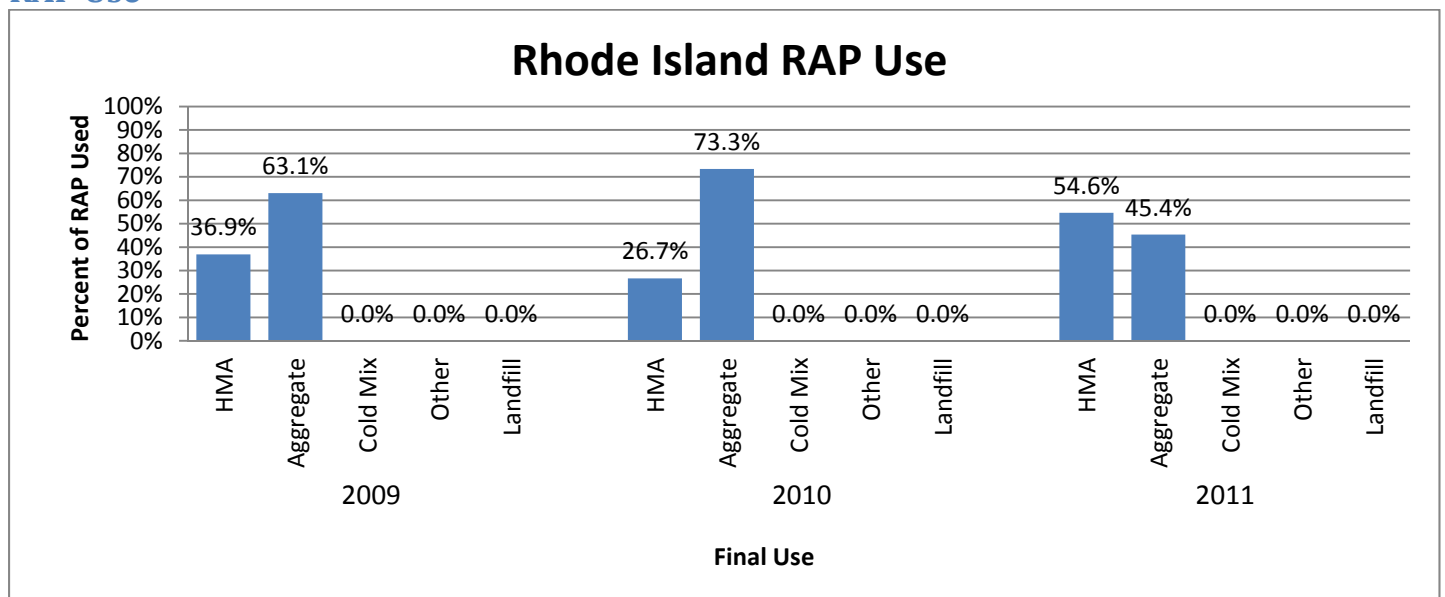
Table B41 summarizes the results received from asphalt mix producers in Rhode Island. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 2 for 2009, 2010 & 2011



### RAP Use



### RAS Use

No contractors reported using RAS in Rhode Island for 2009, 2010 or 2011.

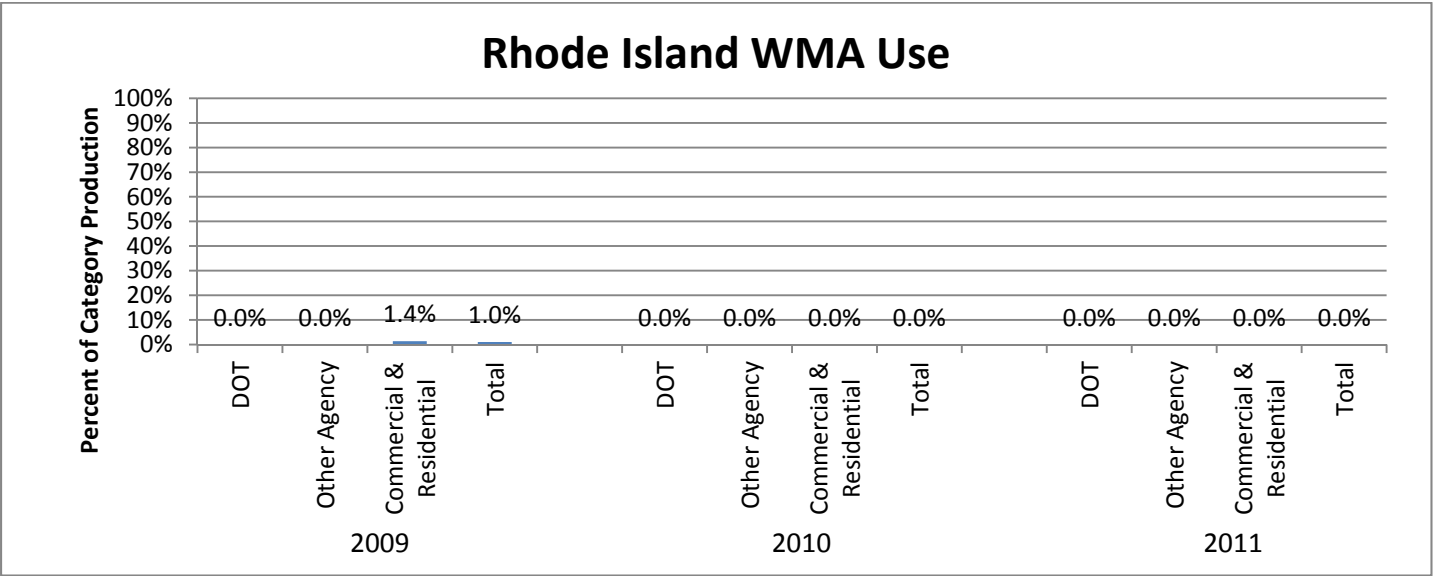




Table B 40: Summary of Rhode Island Data for 2011

Companies Reporting

2

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	23,000	190,745
Total Other Agency Tonnage	50,000	414,663
Total Commercial & Residential Tonnage	135,000	1,119,591
Total Tonnage	208,000	1,725,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	50%	
RAP Tons Received	24,000	199,038
RAP Tons used in HMA/WMA	16,000	132,692
RAP Tons used as Aggregate	13,293	110,242
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	0%	
Average % RAP in Other Agency Mixes	13%	
Average % RAP in Commercial & Residential Mixes	9%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	0%	
WMA DOT Tonnage	-	-
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	-	-
Total WMA Tonnage	-	-
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	0.0%	
Percent WMA Tons using Organic Additive	0.0%	

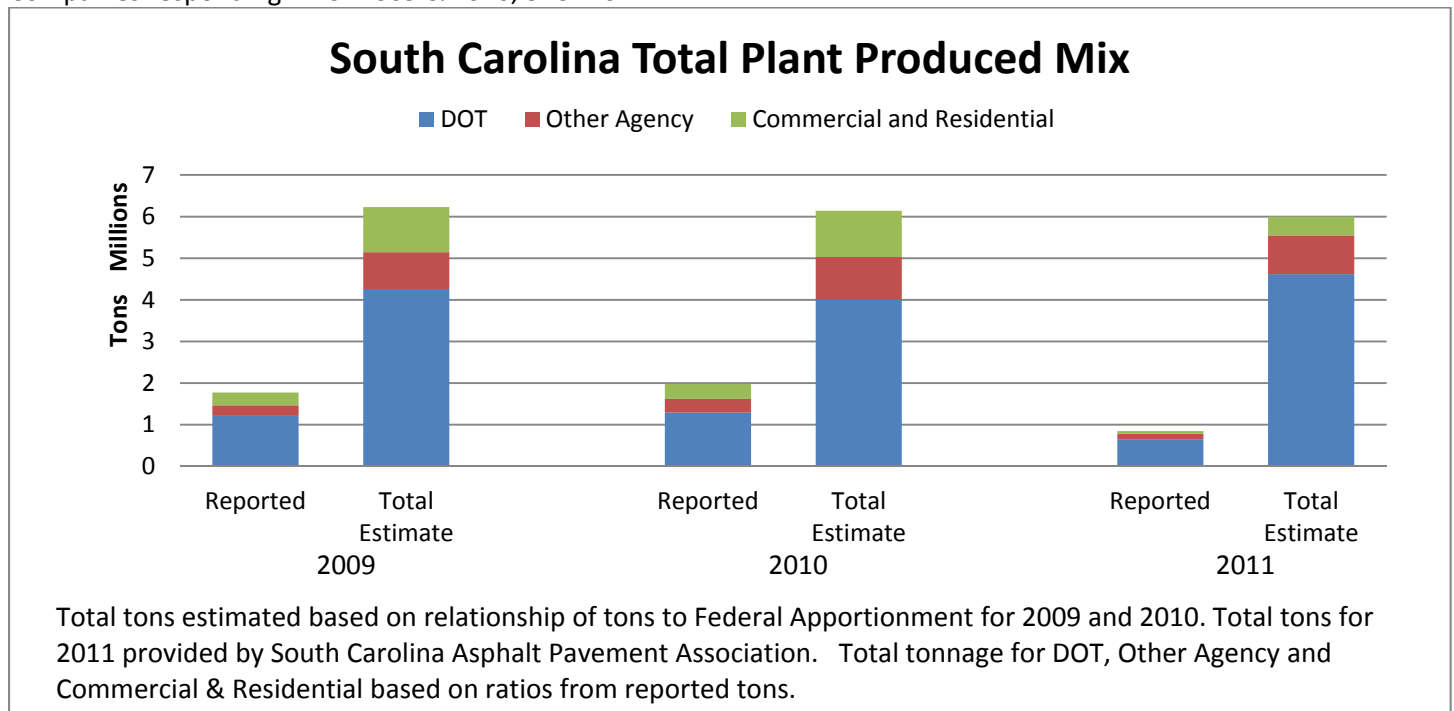
1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## South Carolina

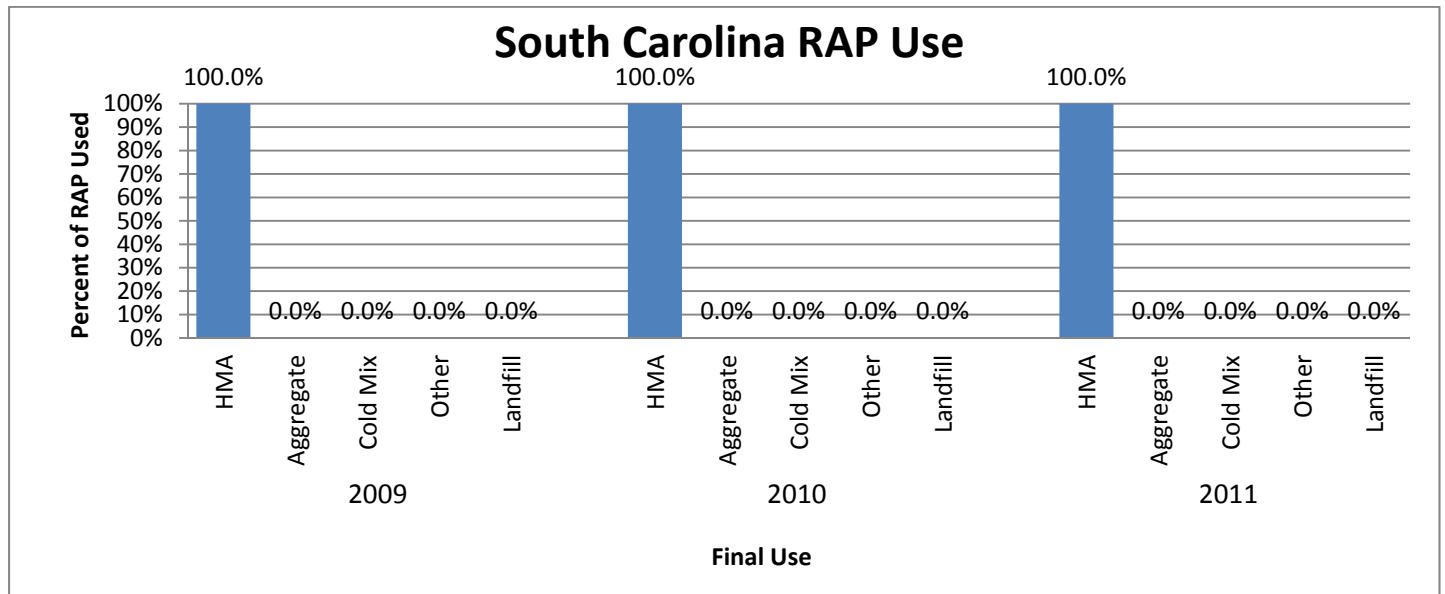
Table B42 summarizes the results received from asphalt mix producers in South Carolina. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 4 for 2009 & 2010, 3 for 2011

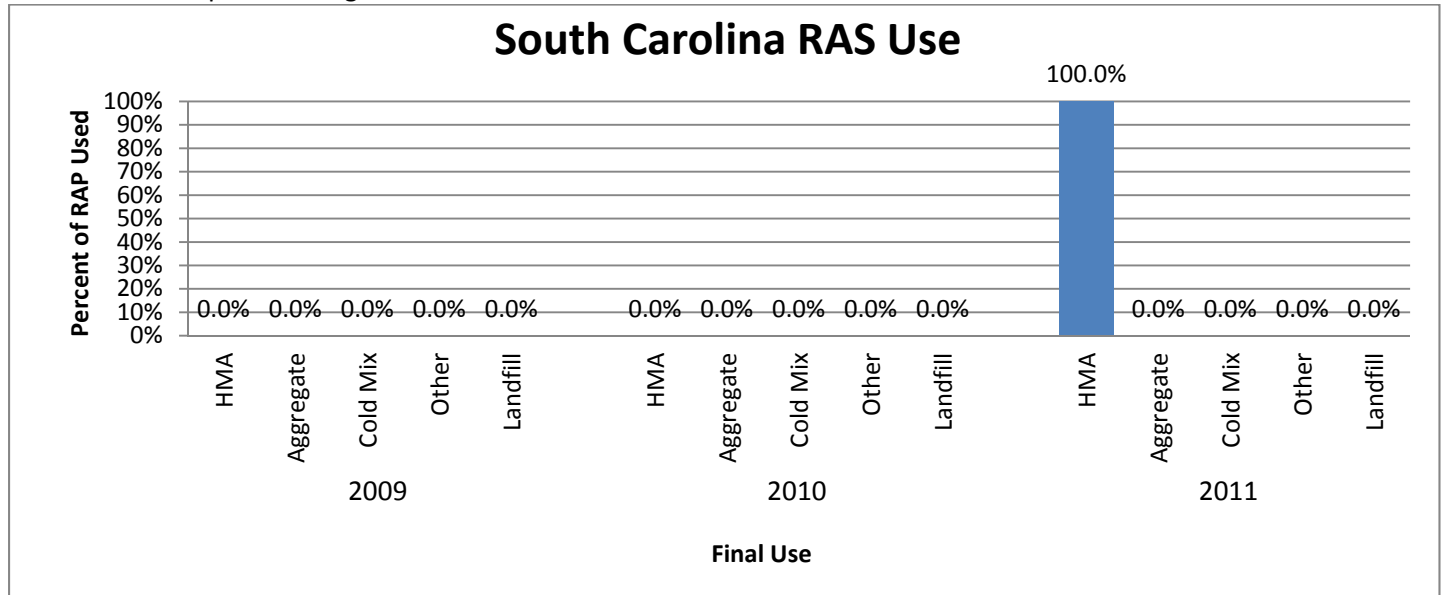


### RAP Use



## RAS Use

No contractos reported using RAS in South Carolina for 2009 or 2010.



## WMA Use

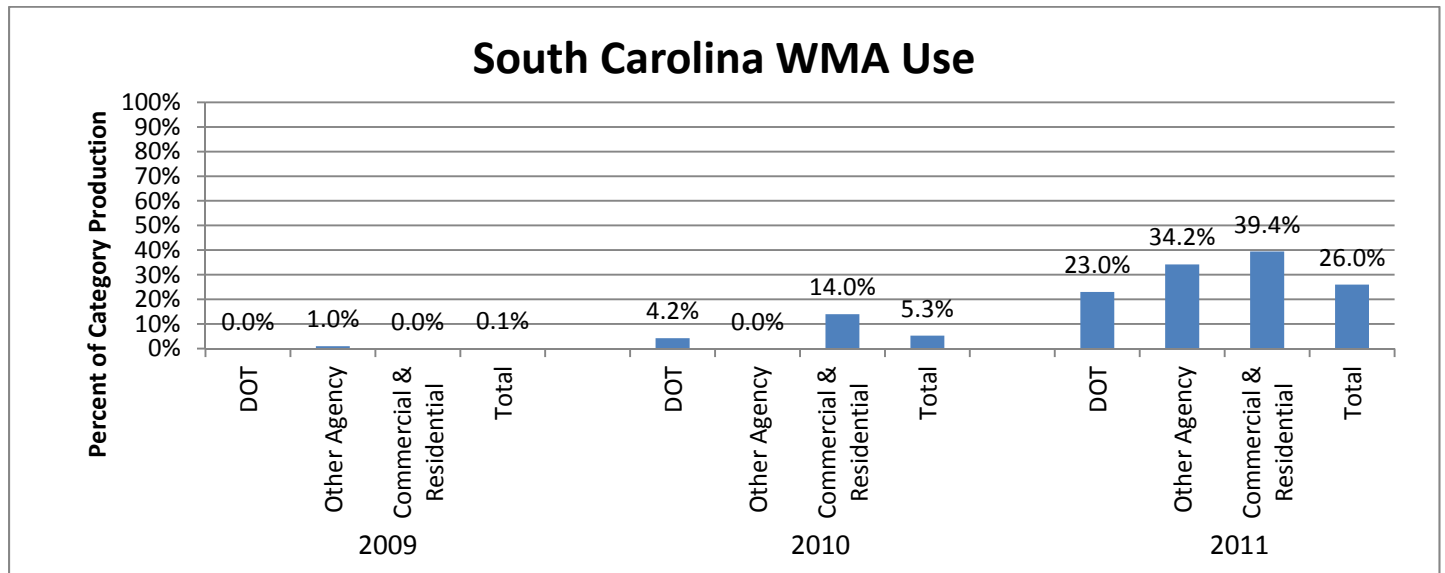


Table B 41: Summary of South Carolina Data for 2011

Companies Reporting

3

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	651,650	4,617,538
Total Other Agency Tonnage	131,650	932,861
Total Commercial & Residential Tonnage	63,450	449,601
Total Tonnage	846,750	6,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	221,100	1,566,696
RAP Tons used in HMA/WMA	182,748	1,294,939
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	20%	
Average % RAP in Other Agency Mixes	32%	
Average % RAP in Commercial & Residential Mixes	35%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	33%	
RAS Tons Received	25,000	177,148
RAS Tons used in HMA/WMA	4,300	30,469
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	2%	
Average % RAS in Commercial & Residential Mixes	2%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	33%	
WMA DOT Tonnage	150,000	1,062,888
WMA Other Agency Tonnage	45,000	318,866
WMA Commercial & Residential Tonnage	25,000	177,148
Total WMA Tonnage	220,000	1,558,902
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

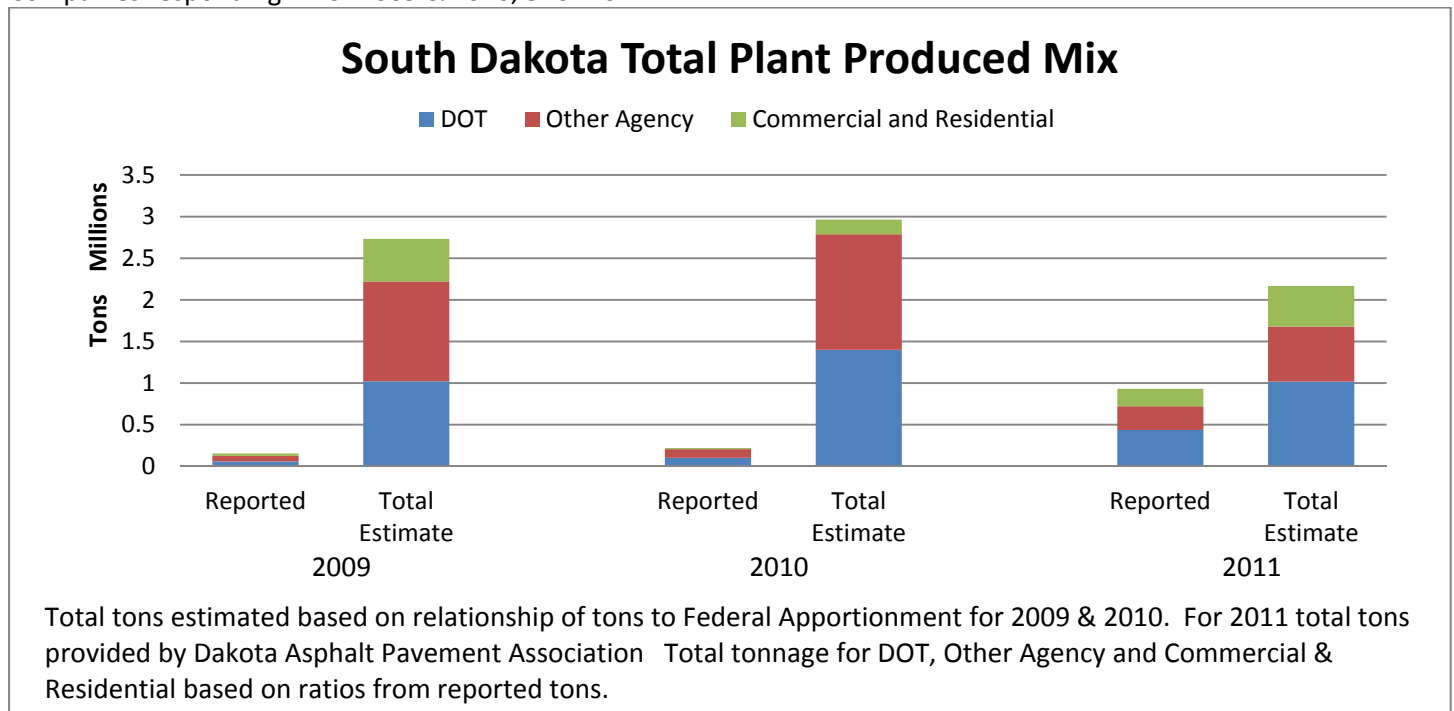
1. Total tons provided by South Carolina Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## South Dakota

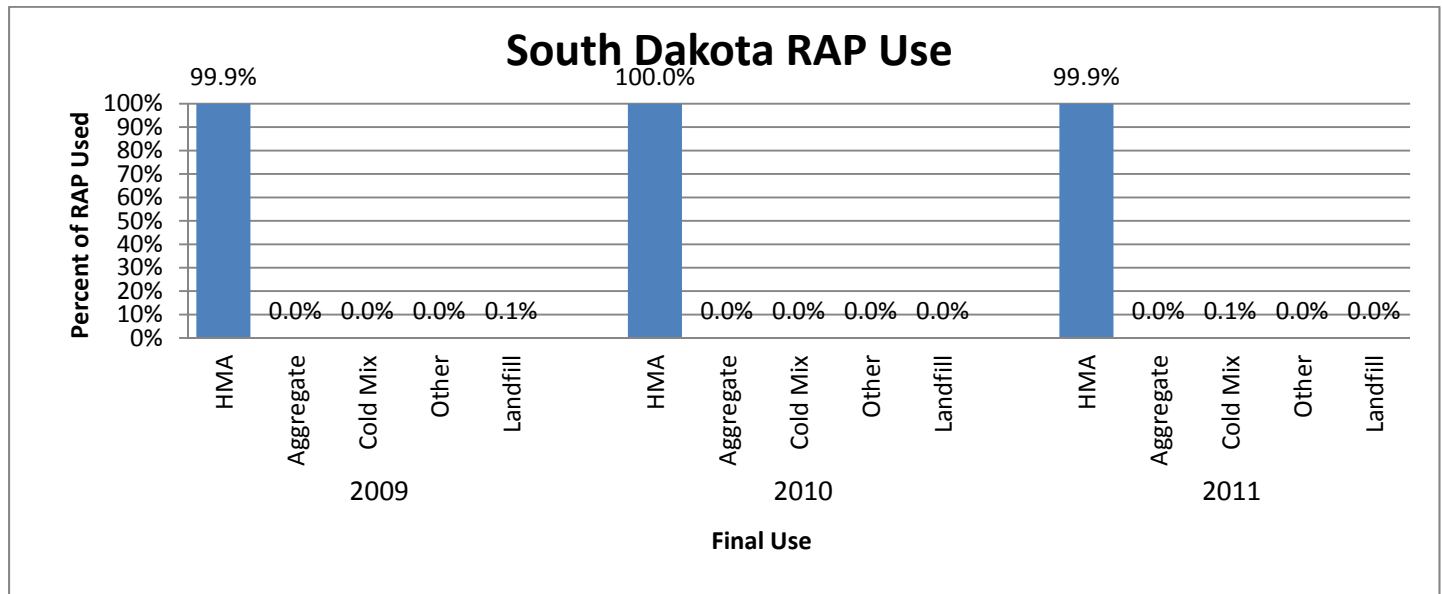
Table B43 summarizes the results received from asphalt mix producers in South Dakota. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 1 for 2009 & 2010, 3 for 2011

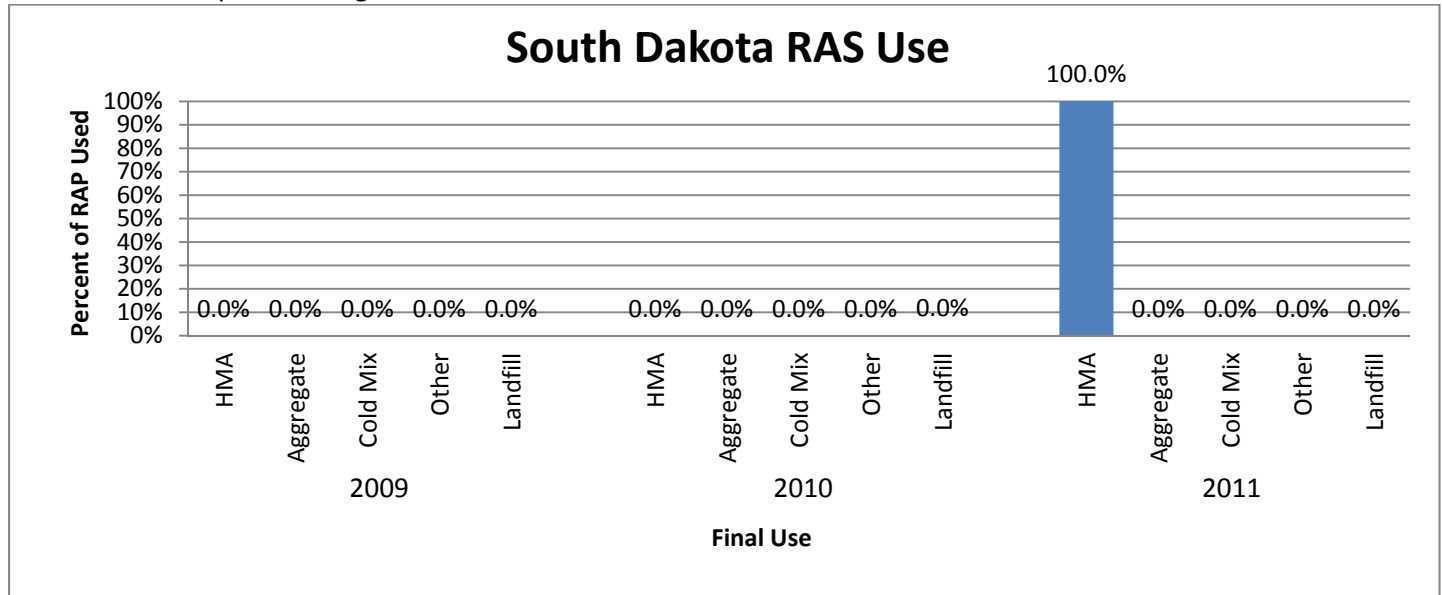


### RAP Use



## RAS Use

No contractors reported using RAS in South Dakota in 2009 or 2010.



## WMA Use

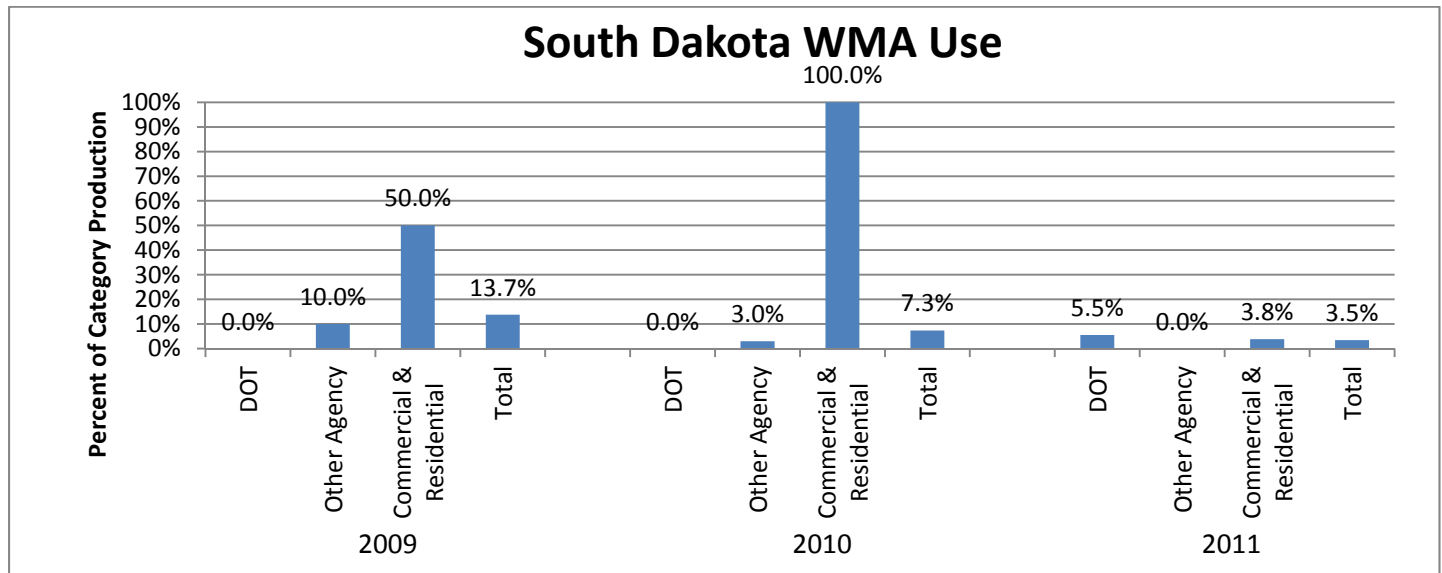


Table B 42: Summary of South Dakota Data for 2011

Companies Reporting

3

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	437,635	1,018,417
Total Other Agency Tonnage	283,785	660,394
Total Commercial & Residential Tonnage	209,785	488,189
Total Tonnage	931,205	2,167,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	160,000	372,335
RAP Tons used in HMA/WMA	163,666	380,866
RAP Tons used as Aggregate	-	-
RAP Tons used in Cold Mix	100	233
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	10%	
Average % RAP in Other Agency Mixes	21%	
Average % RAP in Commercial & Residential Mixes	21%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	67%	
RAS Tons Received	2,400	5,585
RAS Tons used in HMA/WMA	673	1,565
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	3%	
Average % RAS in Commercial & Residential Mixes	3%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	67%	
WMA DOT Tonnage	24,226	56,376
WMA Other Agency Tonnage	-	-
WMA Commercial & Residential Tonnage	8,000	18,617
Total WMA Tonnage	32,226	74,993
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

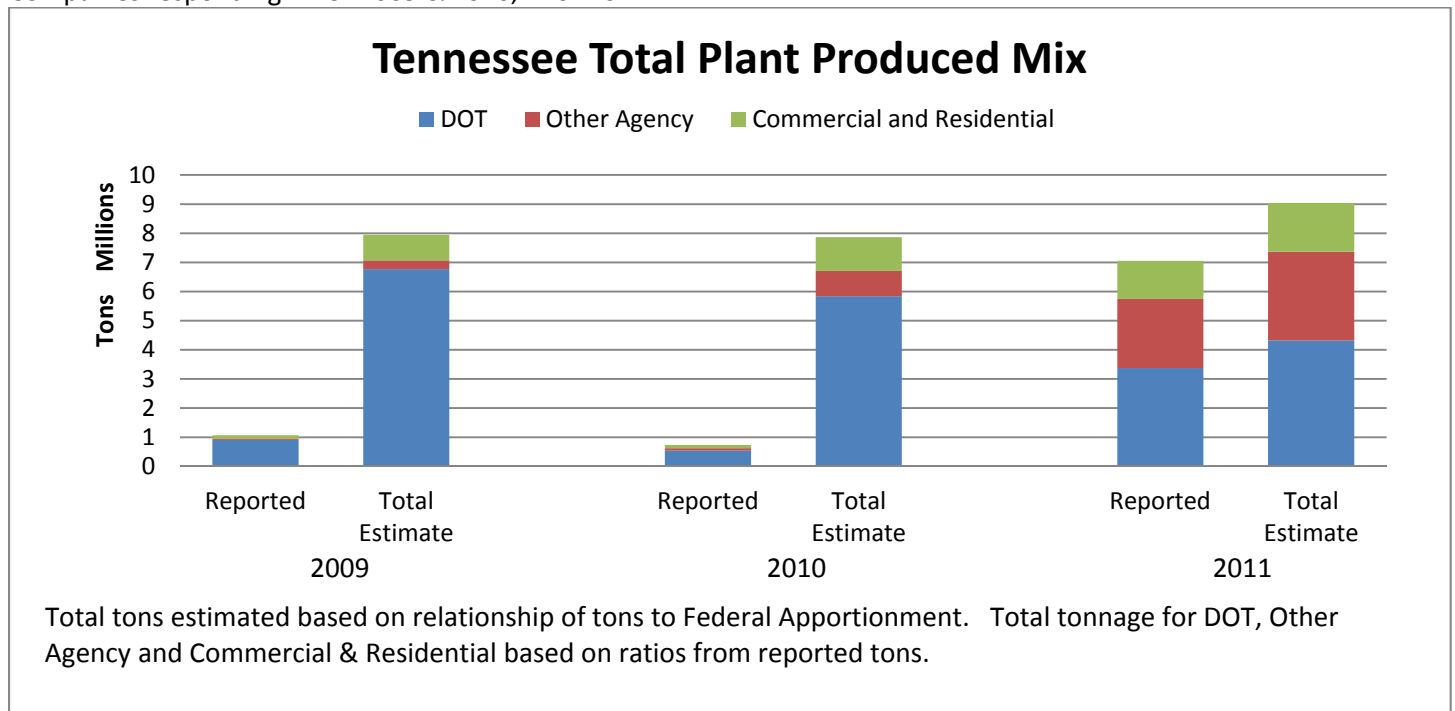
1. Total tons estimated based on relationship of tons to Federal Apportionment for 2009 & 2010. For 2011 total tons provided by Dakota Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential based on ratios from reported tons.

## Tennessee

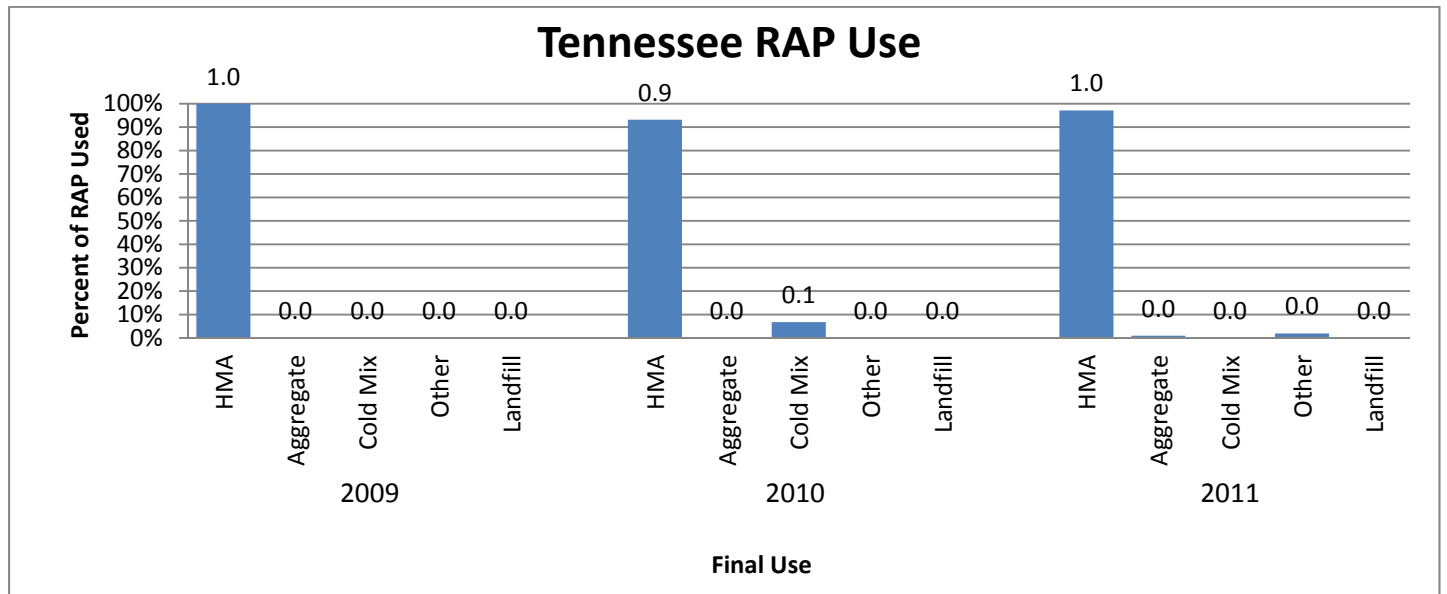
Table B44 summarizes the results received from asphalt mix producers in Tennessee. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 2 for 2009 & 2010, 7 for 2011



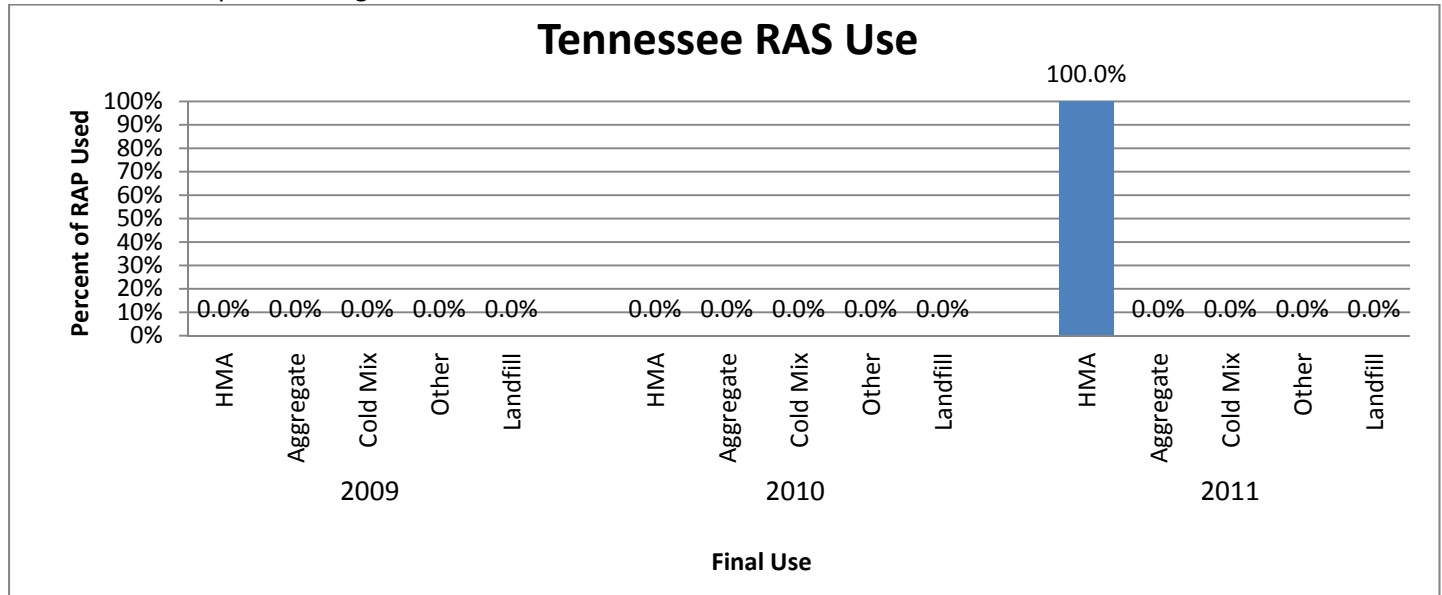
### RAP Use





## RAS Use

No contractors reported using RAS in 2009 or 2010.



## WMA Use

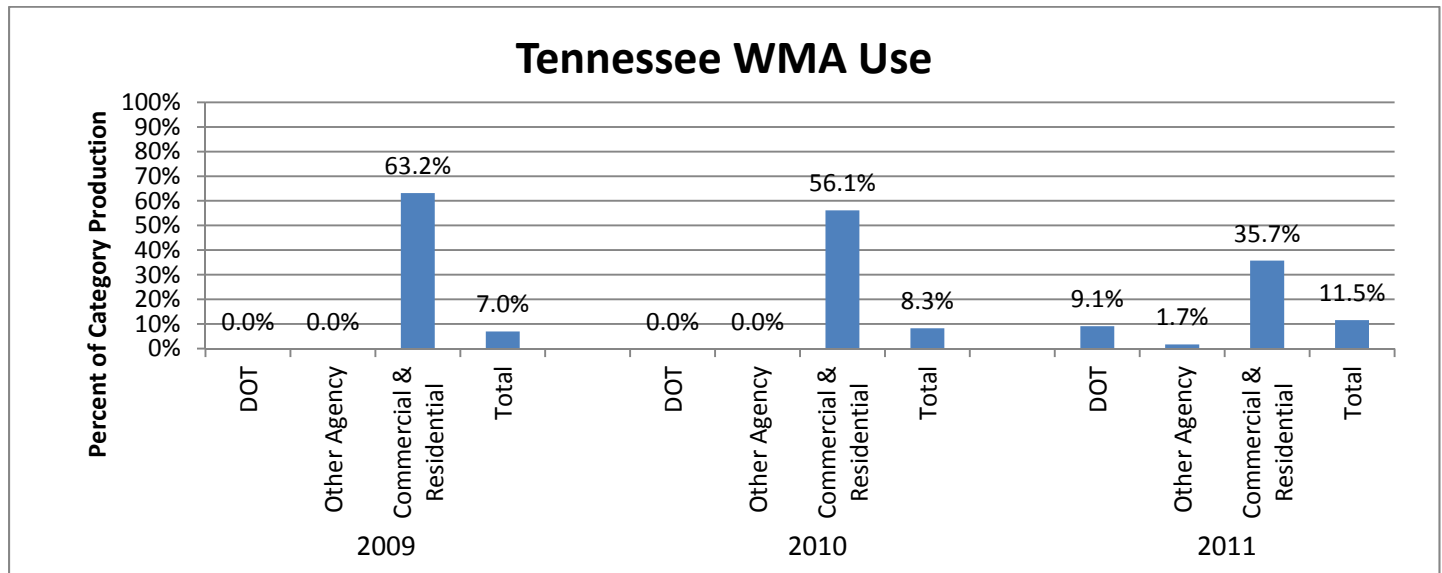


Table B 43: Summary of Tennessee Data for 2011

Companies Reporting

7

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	3,376,134	4,326,947
Total Other Agency Tonnage	2,370,853	3,038,551
Total Commercial & Residential Tonnage	1,307,323	1,675,502
Total Tonnage	7,054,310	9,041,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	1,420,040	1,819,963
RAP Tons used in HMA/WMA	1,010,352	1,294,895
RAP Tons used as Aggregate	10,000	12,816
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	20,000	25,633
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	15%	
Average % RAP in Other Agency Mixes	16%	
Average % RAP in Commercial & Residential Mixes	21%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	29%	
RAS Tons Received	20,749	26,592
RAS Tons used in HMA/WMA	4,000	5,127
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	2%	
Average % RAS in Commercial & Residential Mixes	1%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	86%	
WMA DOT Tonnage	307,938	394,661
WMA Other Agency Tonnage	39,406	50,504
WMA Commercial & Residential Tonnage	466,766	598,221
Total WMA Tonnage	814,110	1,043,386
Percent WMA Tons using Chemical Additives	8.9%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	91.1%	
Percent WMA Tons using Organic Additive	0.0%	

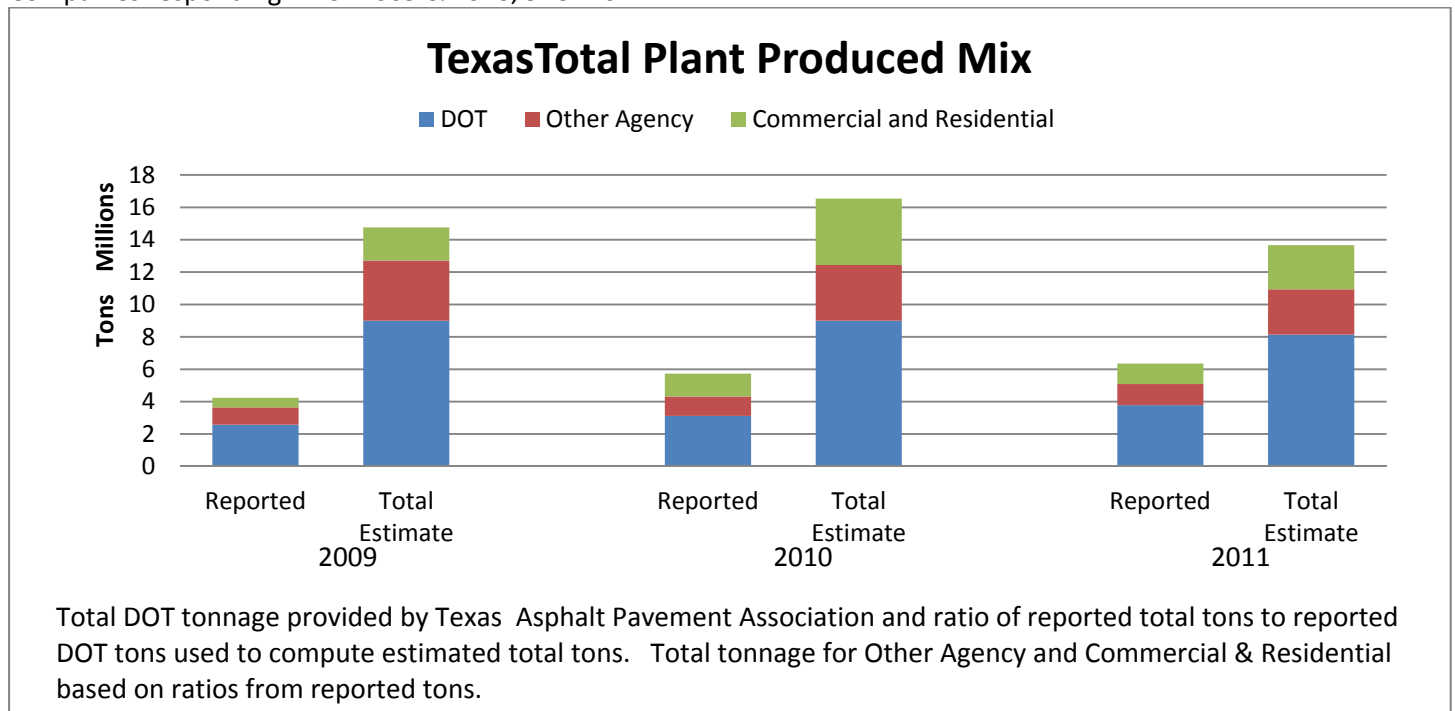
1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Texas

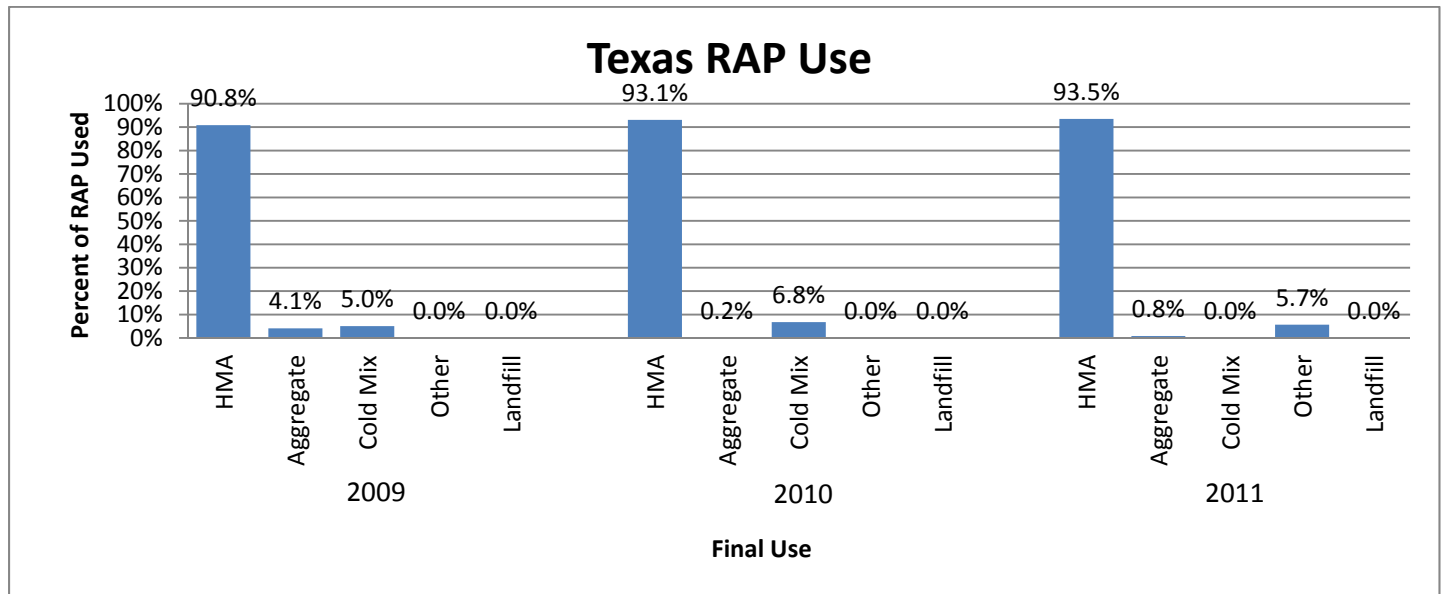
Table B45 summarizes the results received from asphalt mix producers in Texas. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

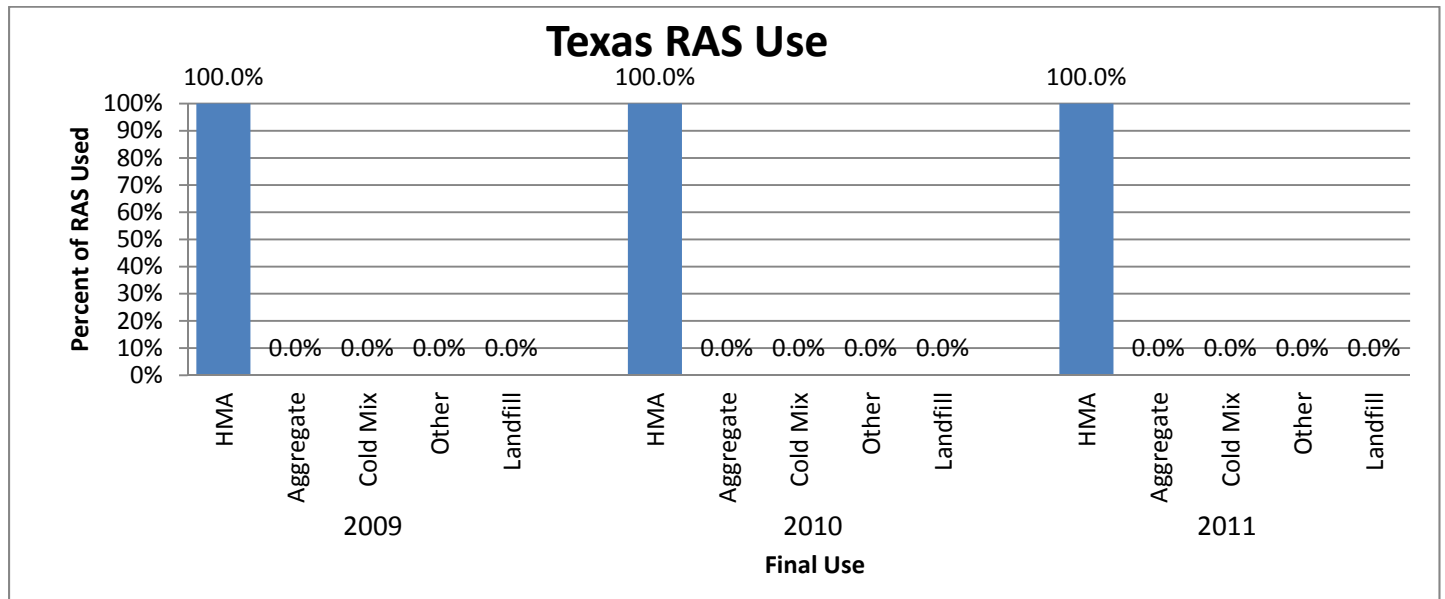
Companies responding: 7 for 2009 & 2010, 9 for 2011



### RAP Use



## RAS Use



## WMA Use

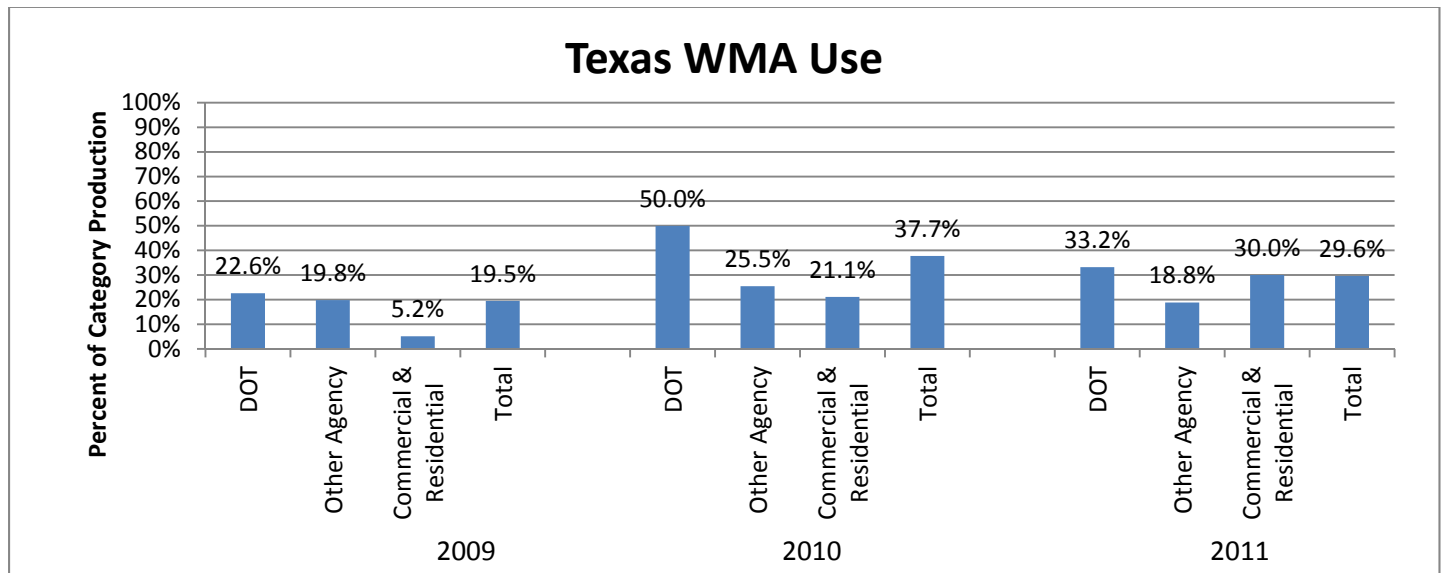


Table B 44: Summary of Texas Data for 2011

Companies Reporting

9

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	3,785,027	8,139,744
Total Other Agency Tonnage	1,302,220	2,800,439
Total Commercial & Residential Tonnage	1,267,985	2,726,817
Total Tonnage	6,355,231	13,667,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	89%	
RAP Tons Received	739,490	1,590,282
RAP Tons used in HMA/WMA	857,709	1,844,513
RAP Tons used as Aggregate	7,690	16,537
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	52,100	112,042
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	20%	
Average % RAP in Other Agency Mixes	13%	
Average % RAP in Commercial & Residential Mixes	17%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	78%	
RAS Tons Received	125,698	270,315
RAS Tons used in HMA/WMA	78,470	168,750
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	2%	
Average % RAS in Other Agency Mixes	4%	
Average % RAS in Commercial & Residential Mixes	3%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	78%	
WMA DOT Tonnage	1,257,405	2,704,064
WMA Other Agency Tonnage	245,372	527,674
WMA Commercial & Residential Tonnage	380,698	818,696
Total WMA Tonnage	1,883,475	4,050,435
Percent WMA Tons using Chemical Additives	2.4%	
Percent WMA Tons using Additive Foaming	2.8%	
Percent WMA Tons using Plant Foaming	94.9%	
Percent WMA Tons using Organic Additive	0.0%	

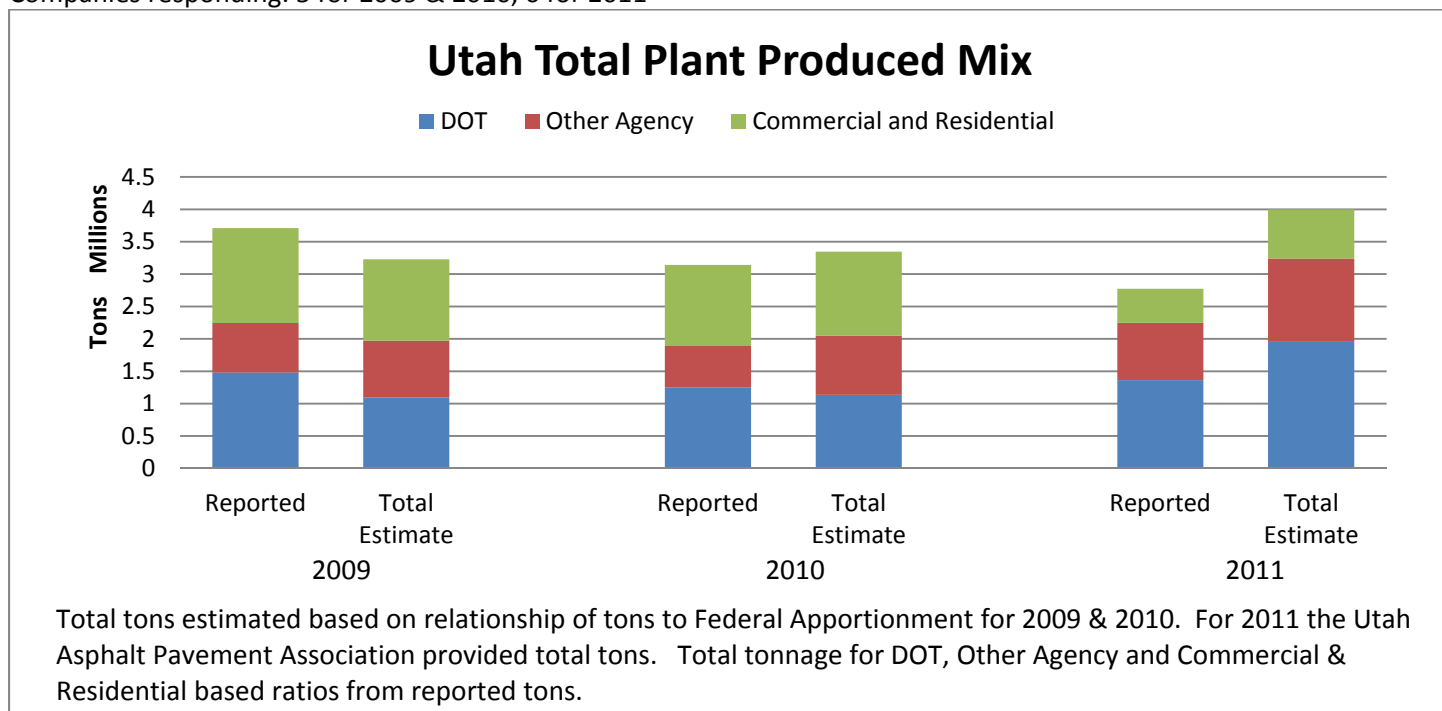
1. Total DOT tonnage provided by Texas Asphalt Pavement Association and ratio of reported total tons to reported DOT tons used to compute estimated total tons. Total tonnage for Other Agency and Commercial & Residential ratios from reported tons.

## Utah

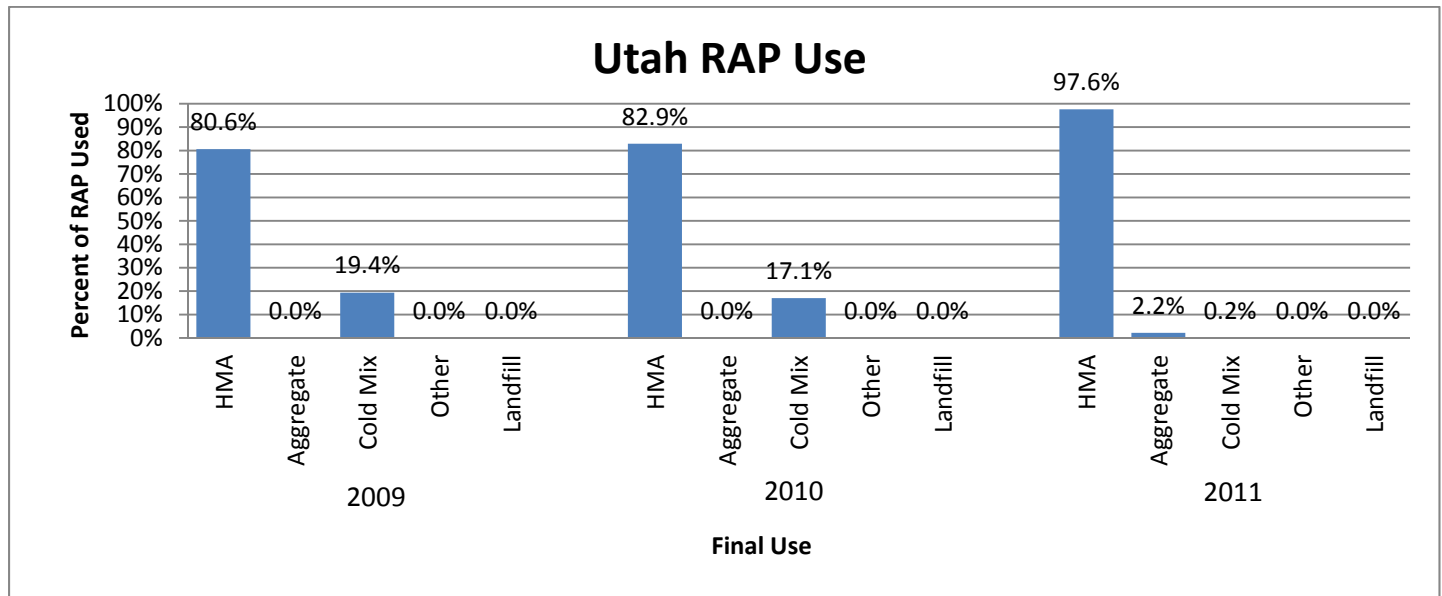
Table B46 summarizes the results received from asphalt mix producers in Utah. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 5 for 2009 & 2010, 6 for 2011



### RAP Use



### RAS Use

No contractors reported using RAS in 2009, 2010 or 2011.

## WMA Use

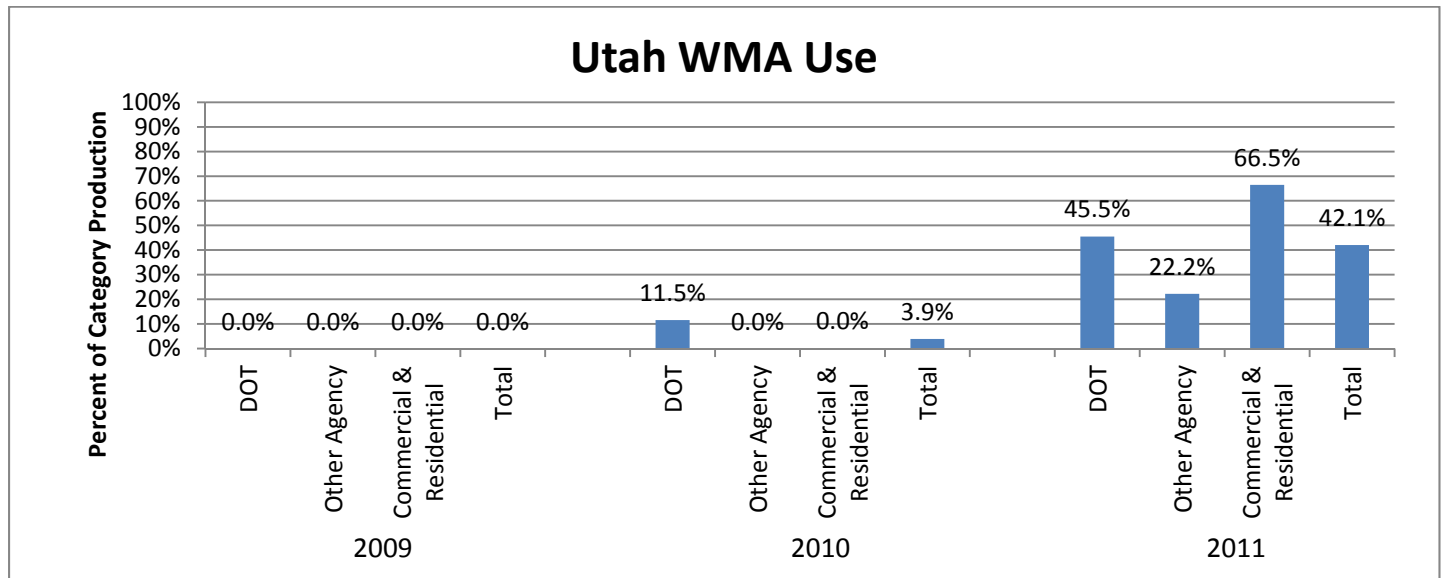


Table B 45: Summary of Utah Data for 2011

Companies Reporting

6

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,362,272	1,964,707
Total Other Agency Tonnage	884,479	1,275,621
Total Commercial & Residential Tonnage	526,735	759,672
Total Tonnage	2,773,485	4,000,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	1,669,722	2,408,121
RAP Tons used in HMA/WMA	701,092	1,011,135
RAP Tons used as Aggregate	16,000	23,076
RAP Tons used in Cold Mix	1,200	1,731
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	23%	
Average % RAP in Other Agency Mixes	28%	
Average % RAP in Commercial & Residential Mixes	32%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	67%	
WMA DOT Tonnage	619,893	894,027
WMA Other Agency Tonnage	196,230	283,009
WMA Commercial & Residential Tonnage	350,178	505,036
Total WMA Tonnage	1,166,301	1,682,073
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tons provided by the Utah Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

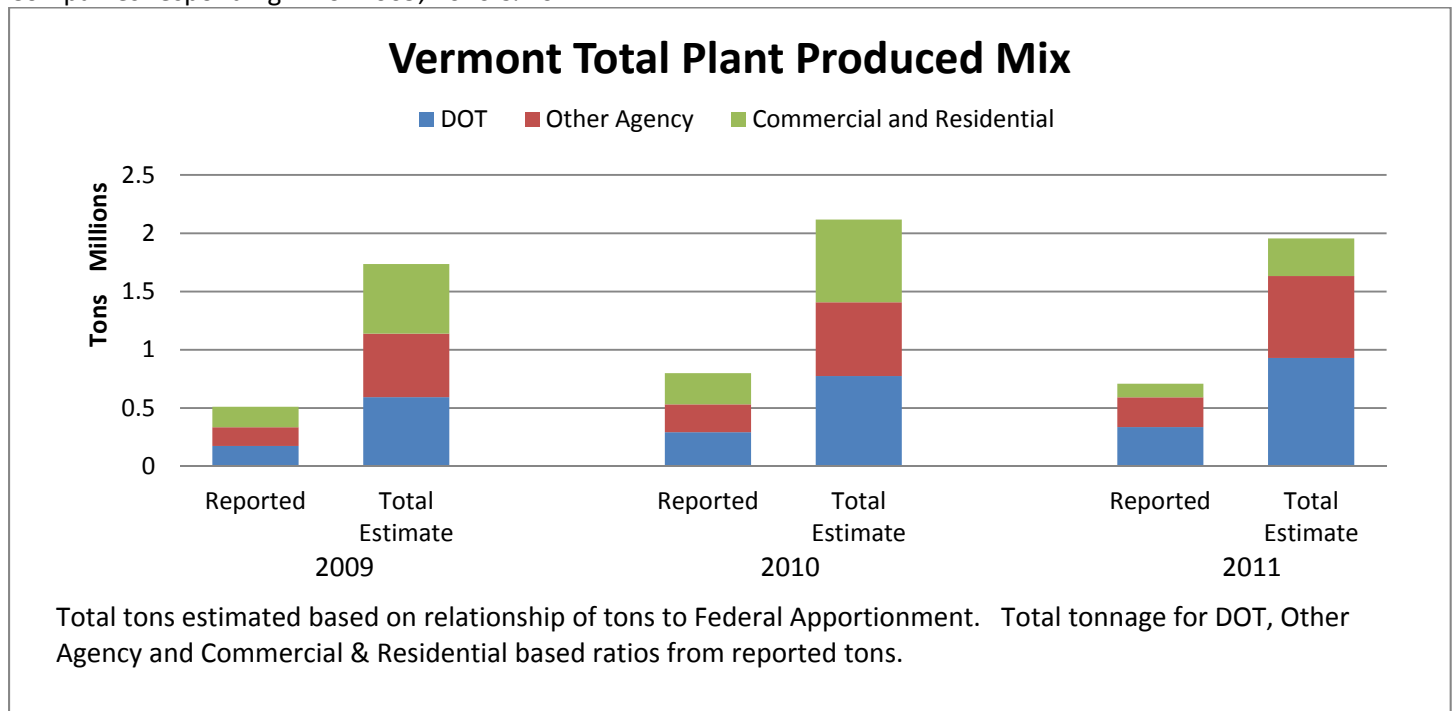


## Vermont

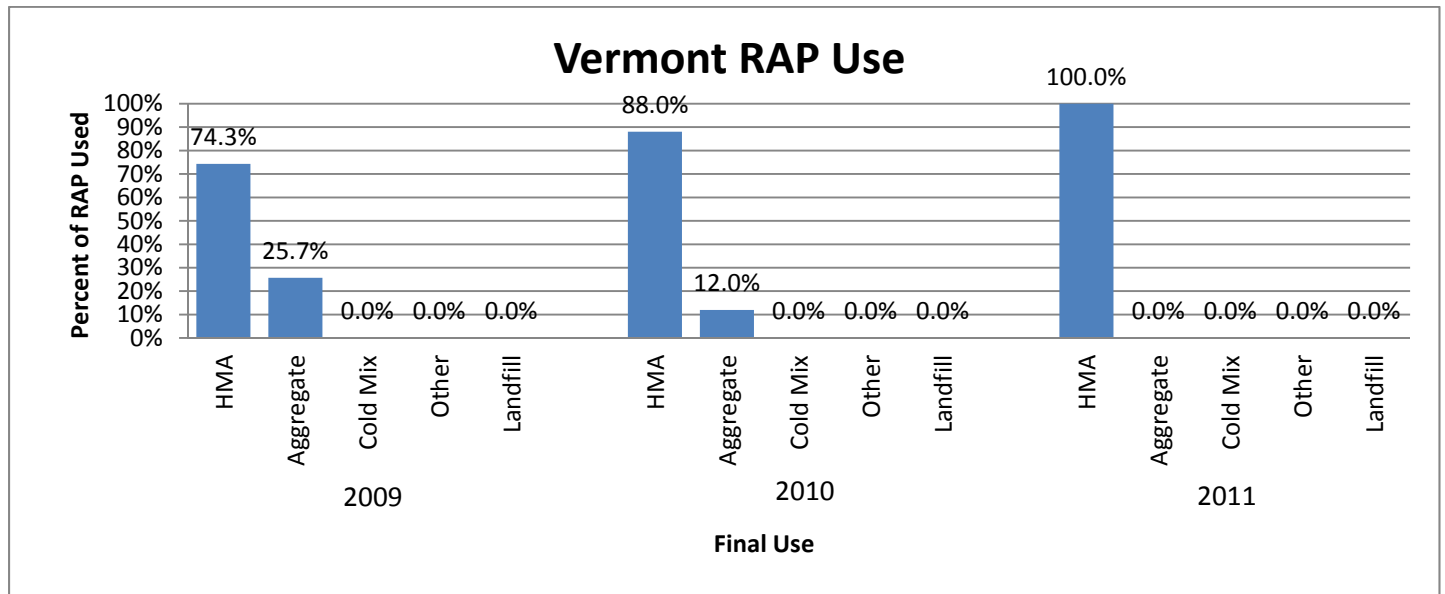
Table B47 summarizes the results received from asphalt mix producers in Vermont. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 1 for 2009, 2010 & 2011



### RAP Use



### RAS Use

No contractor reported using RAS in 2009, 2010 or 2011.

## WMA Use

No contractor reported using WMA in 2009 or 2010.

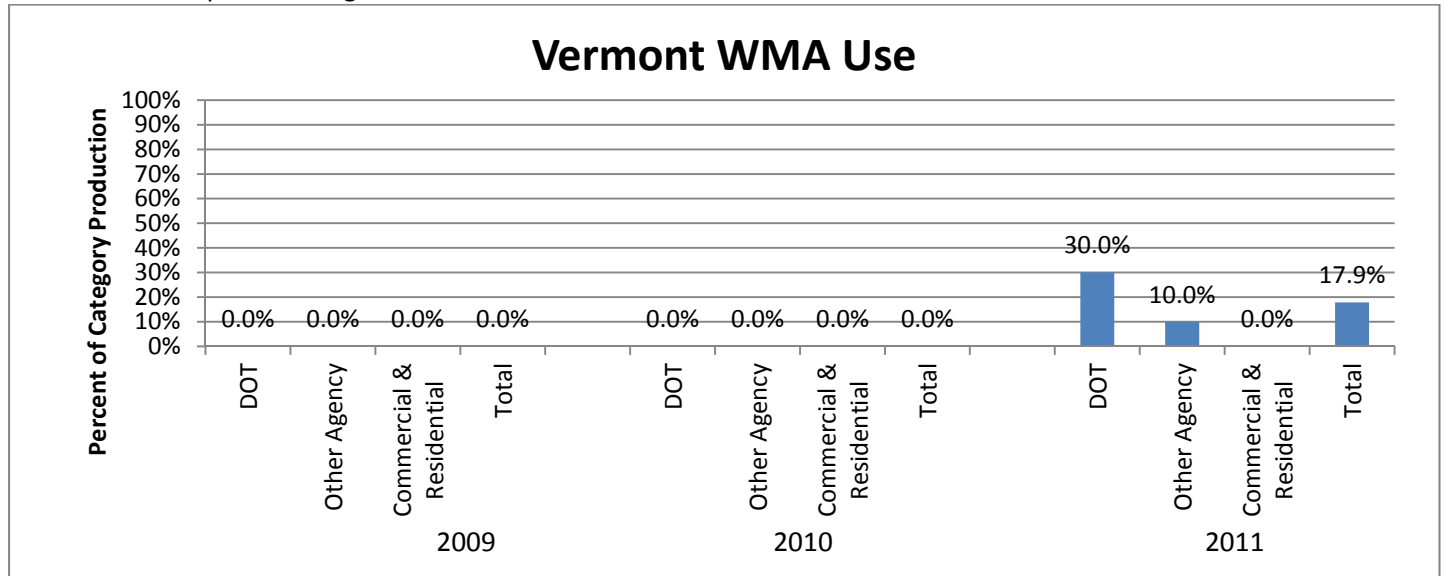


Table B 46: Summary of Vermont Data for 2011

Companies Reporting

1

<b>HMA/WMA</b>				
	Reported		Total Estimated <sup>1</sup>	
	2009	2010	2009	2010
Total DOT Tonnage	175,000	293,000	593,505	775,483
Total Other Agency Tonnage	161,000	239,000	546,024	632,561
Total Commercial & Residential Tonnage	176,000	268,000	596,896	709,315
Total Tonnage	512,000	800,000	1,736,425	2,117,360
<b>Reclaimed Asphalt Pavement (RAP)</b>				
	Reported		Total Estimated	
	2009	2010	2009	2010
Percent Companies using RAP	100%	100%		
RAP Tons Received	91,000	157,000	308,622	415,532
RAP Tons used in HMA/WMA	107,000	162,000	362,886	428,765
RAP Tons used as Aggregate	37,000	22,000	125,484	58,227
RAP Tons used in Cold Mix	-	-	-	-
RAP Tons used as Other	-	-	-	-
RAP Tons Landfilled	21	20	71	54
Average % RAP in DOT Mixes	15%	15%		
Average % RAP in Other Agency Mixes	25%	25%		
Average % RAP in Commercial & Residential Mixes	25%	25%		
<b>Reclaimed Asphalt Shingles (RAS)</b>				
	Reported		Total Estimated	
	2009	2010	2009	2010
Percent Companies using RAS	0%	0%		
RAS Tons Received	-	-	-	-
RAS Tons used in HMA/WMA	-	-	-	-
RAS Tons used as Aggregate	-	-	-	-
RAS Tons used in Cold Mix	-	-	-	-
RAS Tons used as Other	-	-	-	-
RAS Tons Landfilled	-	-	-	-
Average % RAS in DOT Mixes	0%	0%		
Average % RAS in Other Agency Mixes	0%	0%		
Average % RAS in Commercial & Residential Mixes	0%	0%		
<b>Warm-Mix Asphalt</b>				
	Reported		Total Estimated	
	2009	2010	2009	2010
Percent Companies using WMA	0%	0%		
WMA DOT Tonnage	-	-	-	-
WMA Other Agency Tonnage	-	-	-	-
WMA Commercial & Residential Tonnage	-	-	-	-
Total WMA Tonnage	-	-	-	-
Percent WMA Tons using Chemical Additives	0%	0%		
Percent WMA Tons using Additive Foaming	0%	0%		
Percent WMA Tons using Plant Foaming	0%	0%		
Percent WMA Tons using Organic Additive	0%	0%		

1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential based on ratios from reported tons.

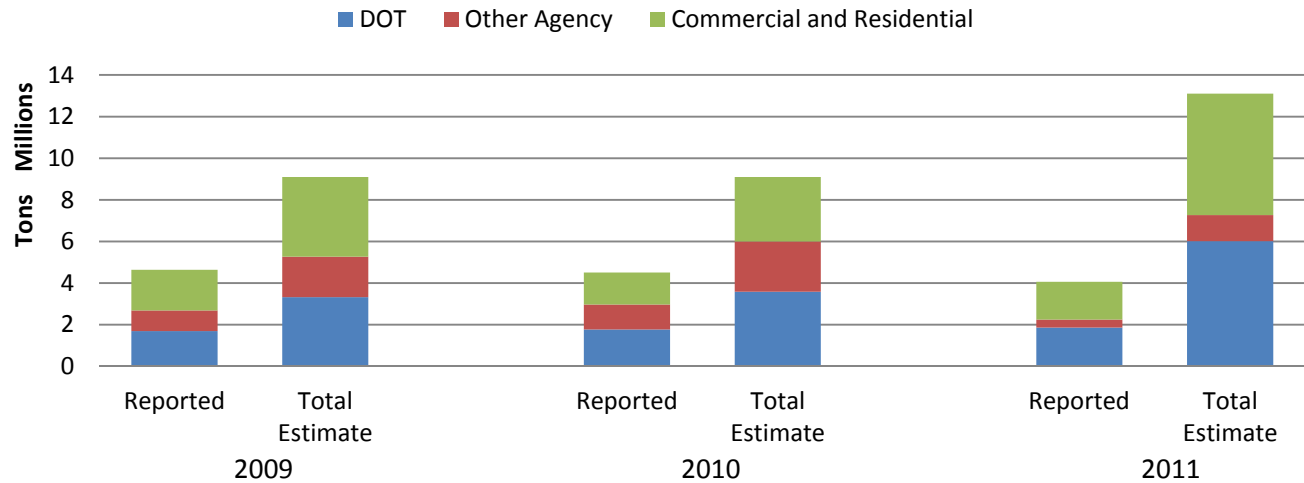
## Virginia

Table B48 summarizes the results received from asphalt mix producers in Virginia. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 5 for 2009 & 2010, 7 for 2011

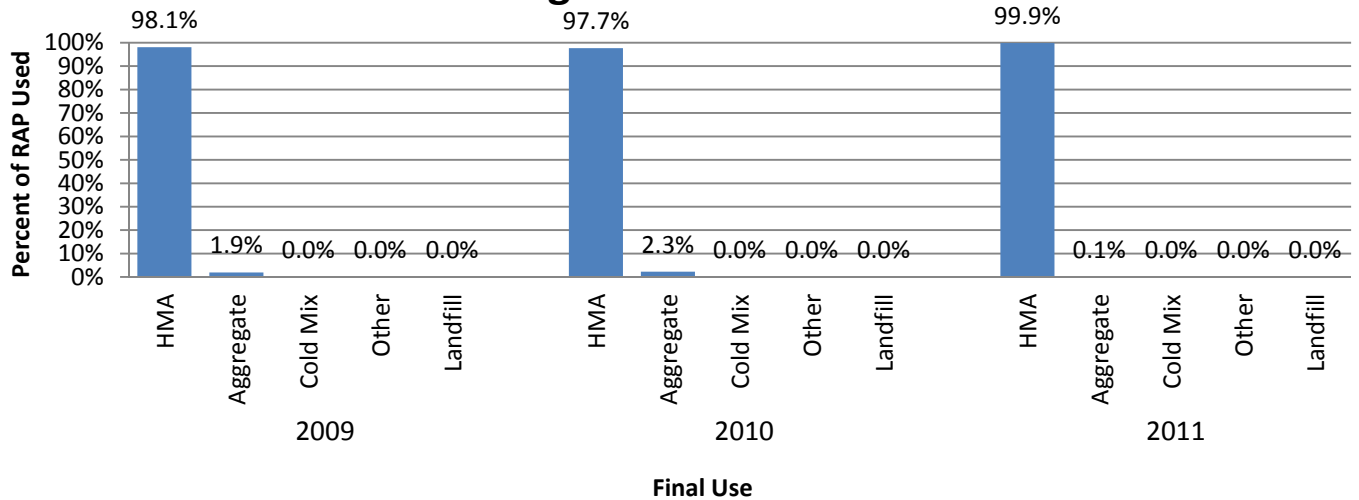
#### Virginia Total Plant Produced Mix



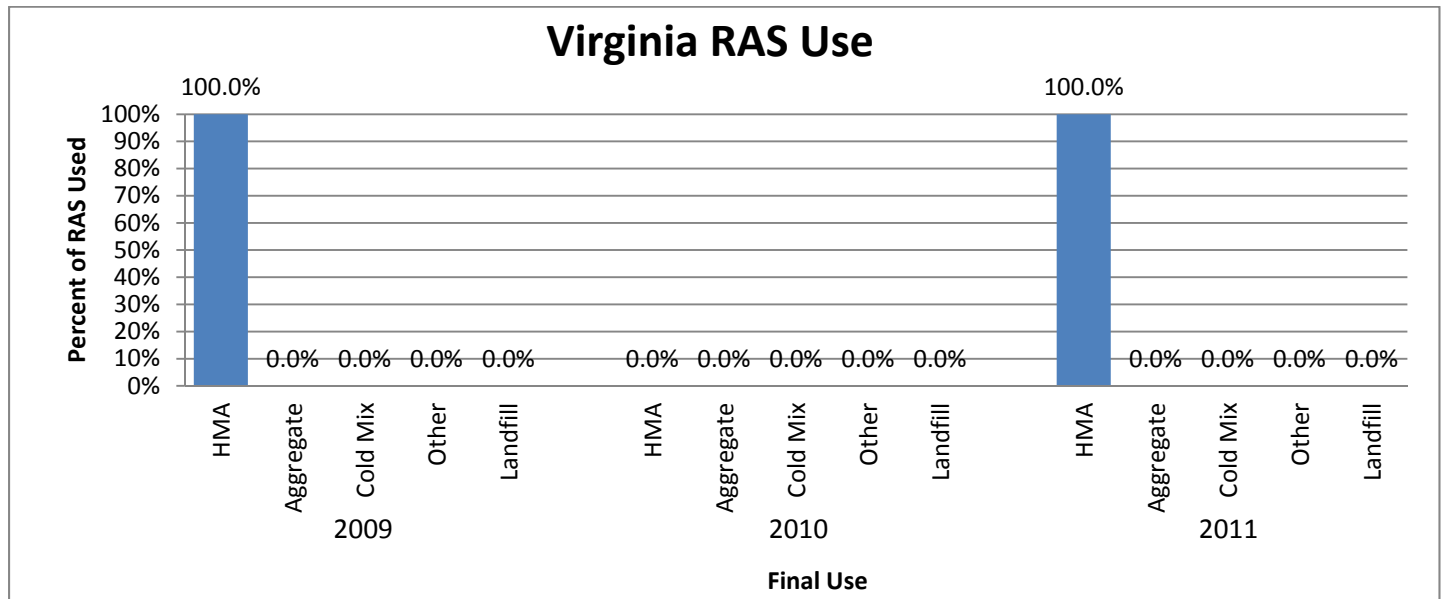
Total tonnage provided by the Virginia Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential based on ratios from reported tons.

### RAP Use

#### Virginia RAP Use



## RAS Use



## WMA Use

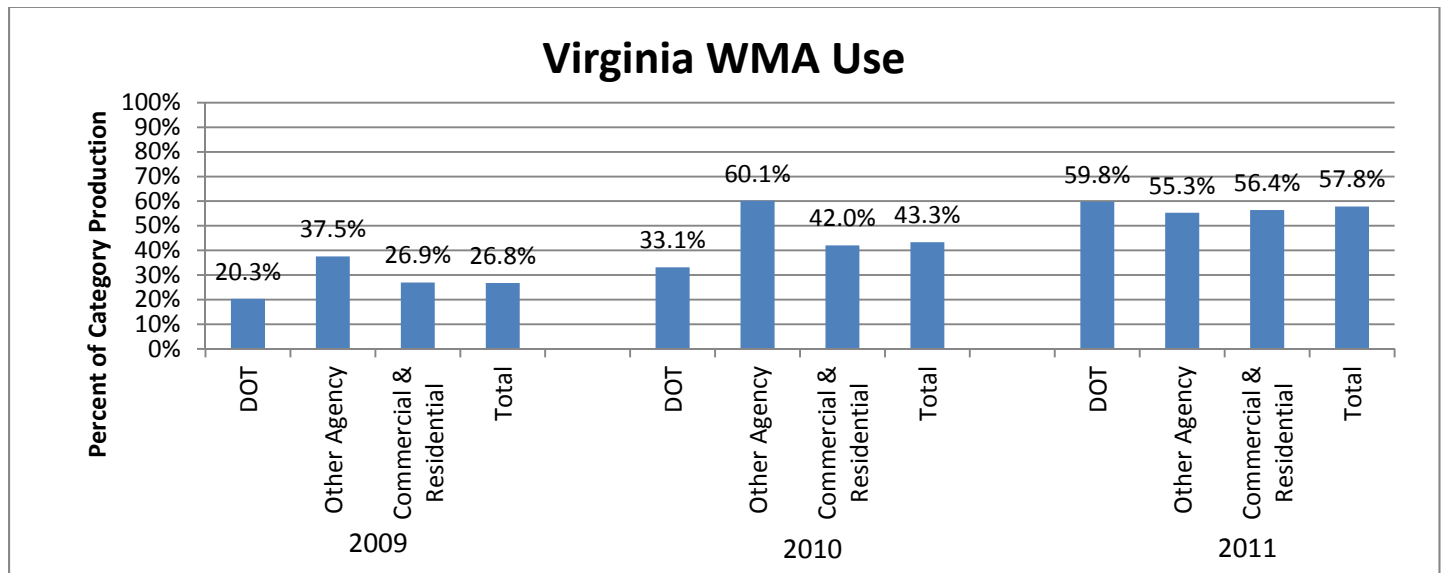


Table B 47: Summary of Virginia Data for 2011

Companies Reporting

7

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,865,012	6,017,189
Total Other Agency Tonnage	387,351	1,249,732
Total Commercial & Residential Tonnage	1,807,948	5,833,079
Total Tonnage	4,060,311	13,100,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	1,228,520	3,963,641
RAP Tons used in HMA/WMA	1,054,694	3,402,817
RAP Tons used as Aggregate	1,103	3,559
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	23%	
Average % RAP in Other Agency Mixes	23%	
Average % RAP in Commercial & Residential Mixes	28%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	43%	
RAS Tons Received	100	323
RAS Tons used in HMA/WMA	2,277	7,346
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	2%	
Average % RAS in Commercial & Residential Mixes	2%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	1,114,468	3,595,669
WMA Other Agency Tonnage	214,187	691,044
WMA Commercial & Residential Tonnage	1,019,590	3,289,558
Total WMA Tonnage	2,348,245	7,576,270
Percent WMA Tons using Chemical Additives	0.3%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	99.7%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tonnage provided by the Virginia Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

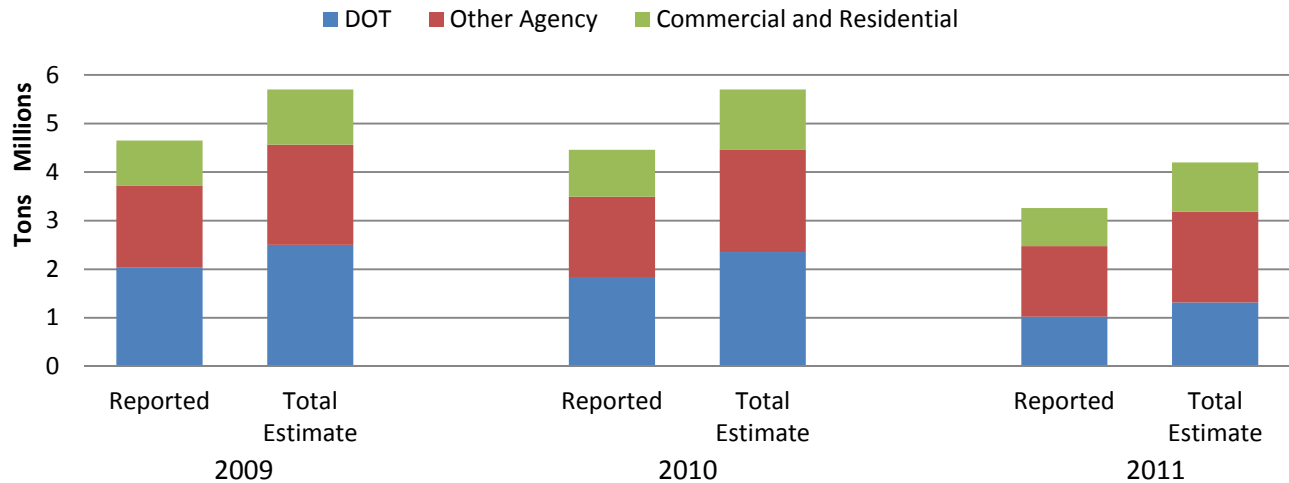
## Washington

Table B49 summarizes the results received from asphalt mix producers in Washington. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 6 for 2009 & 2010, 4 for 2011

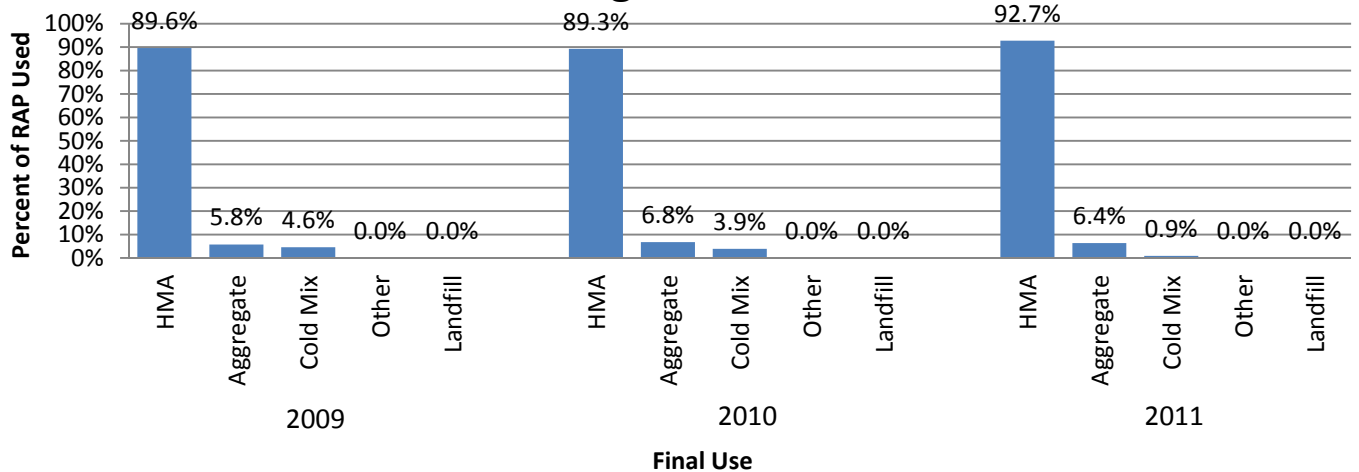
#### Washington Total Plant Produced Mix



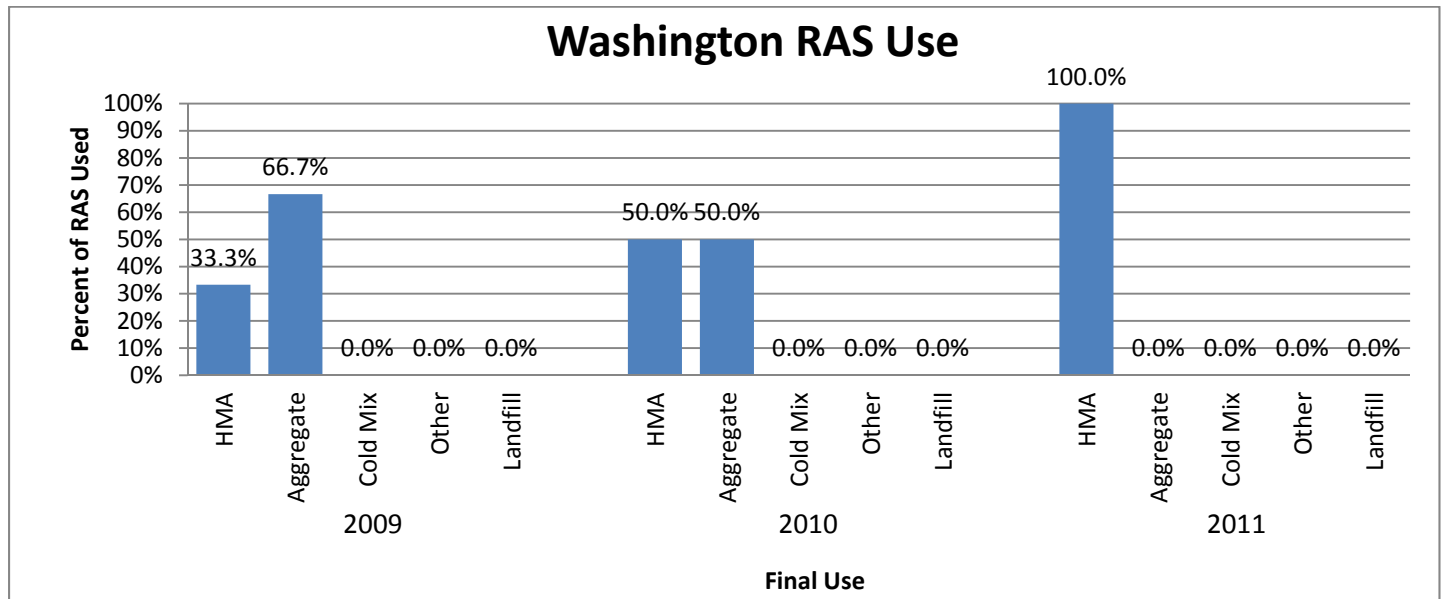
Total tonnage provided by the Washington Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential based on ratios from reported tons.

### RAP Use

#### Washington RAP Use



## RAS Use



## WMA Use

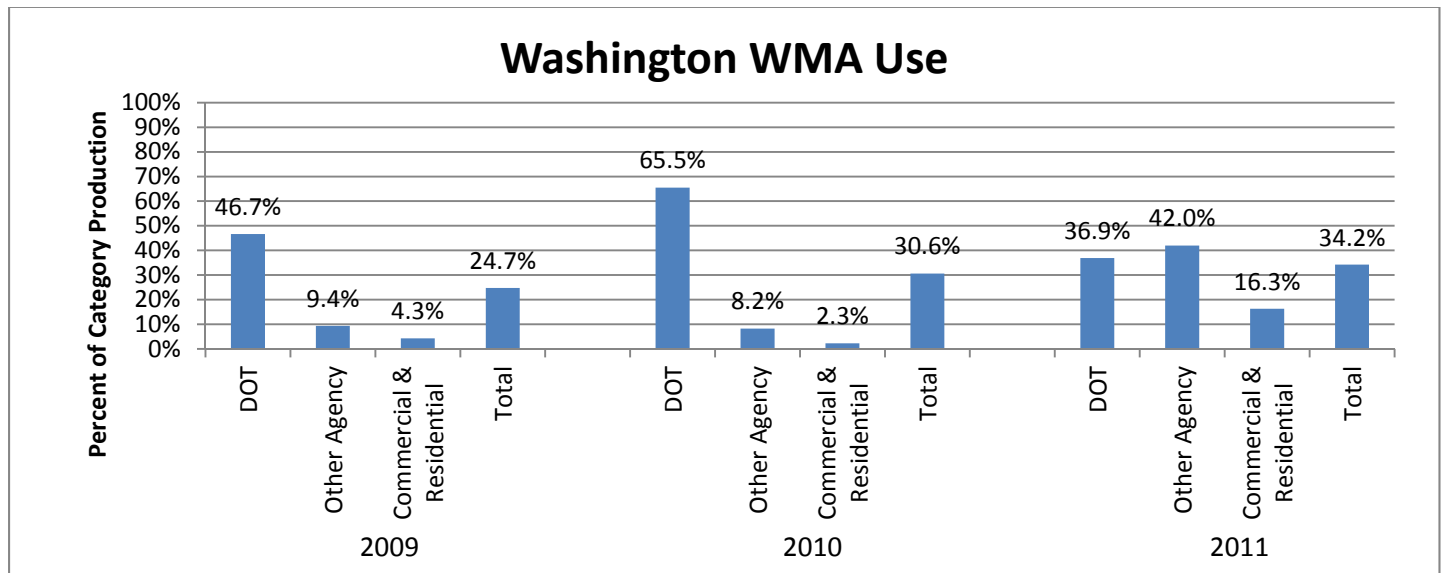




Table B 48: Summary of Washington data for 2011

Companies Reporting

4

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,022,193	1,316,408
Total Other Agency Tonnage	1,452,457	1,870,514
Total Commercial & Residential Tonnage	786,657	1,013,078
Total Tonnage	3,261,307	4,200,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	264,967	341,232
RAP Tons used in HMA/WMA	509,616	656,297
RAP Tons used as Aggregate	35,100	45,203
RAP Tons used in Cold Mix	4,857	6,255
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	9%	
Average % RAP in Other Agency Mixes	14%	
Average % RAP in Commercial & Residential Mixes	24%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	25%	
RAS Tons Received	1	1
RAS Tons used in HMA/WMA	351	452
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	1%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	377,270	485,858
WMA Other Agency Tonnage	609,770	785,278
WMA Commercial & Residential Tonnage	128,405	165,364
Total WMA Tonnage	1,115,444	1,436,500
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	98.3%	
Percent WMA Tons using Organic Additive	1.7%	

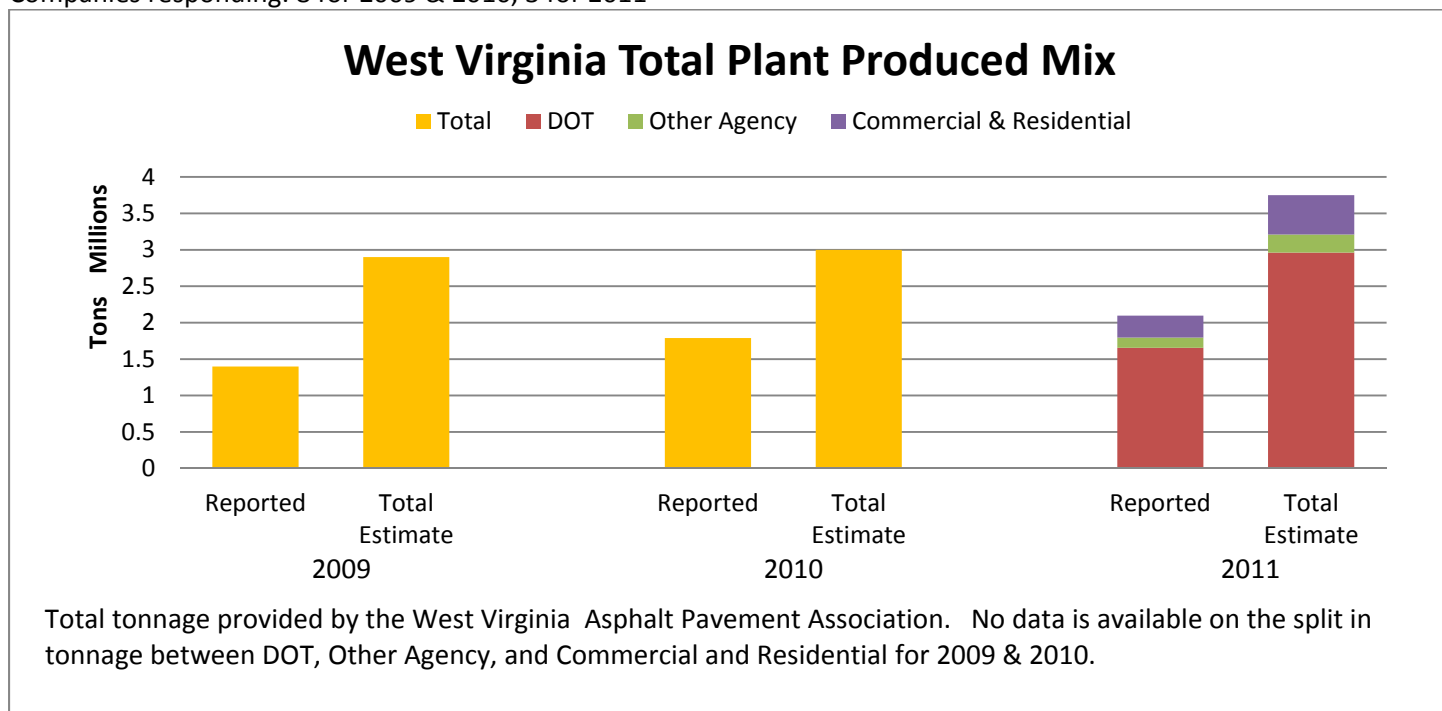
1. Total tonnage provided by the Washington Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## West Virginia

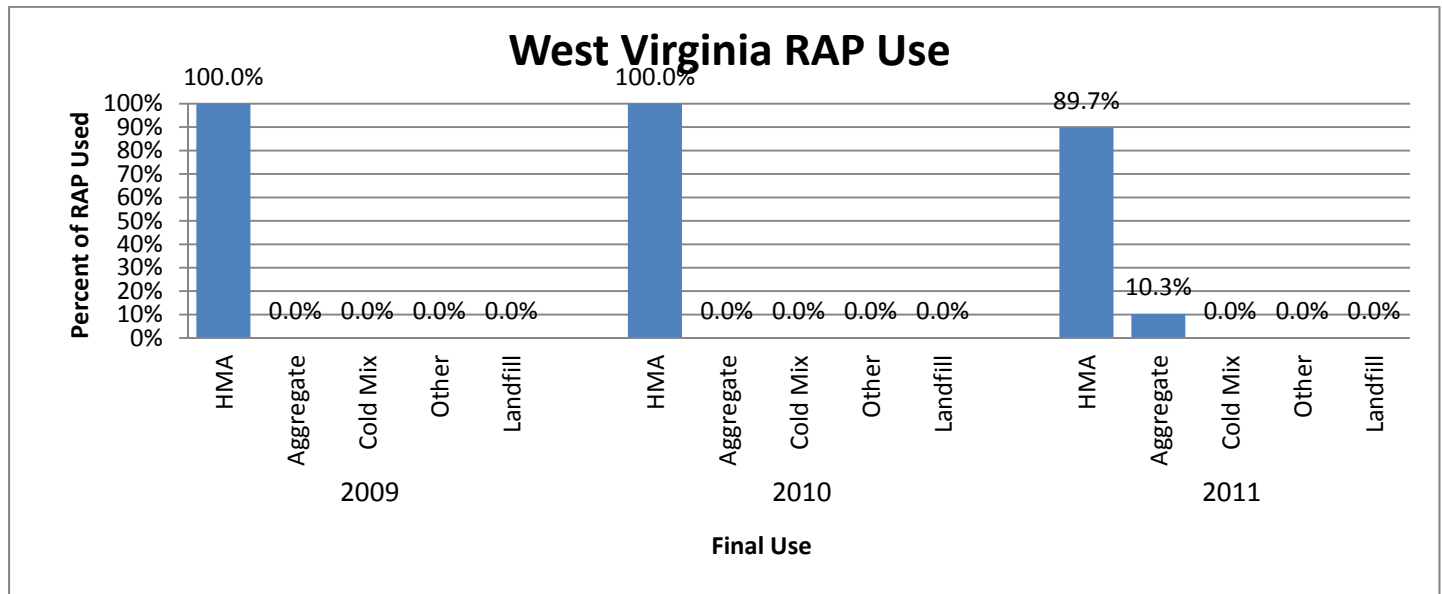
Table B50 summarizes the results received from asphalt mix producers in West Virginia. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 8 for 2009 & 2010, 3 for 2011

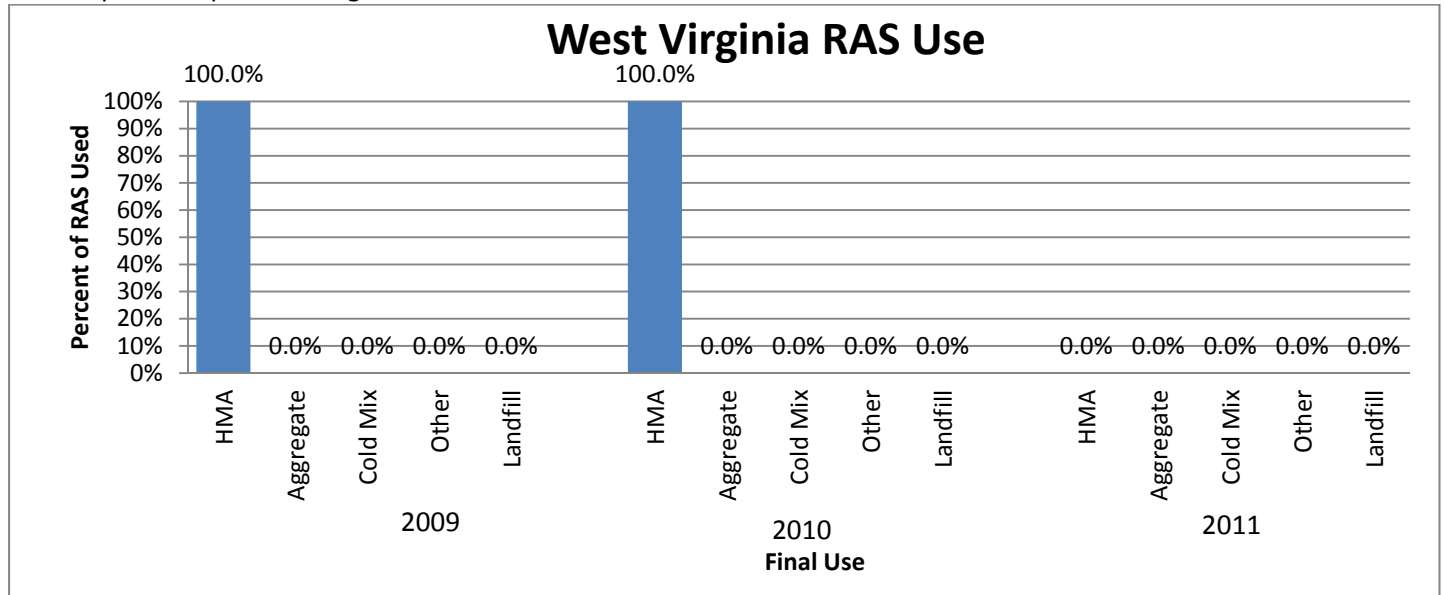


### RAP Use



## RAS Use

No companies reported using RAS in 2011



## WMA Use

No contractor reported using WMA in 2009 or 2010.

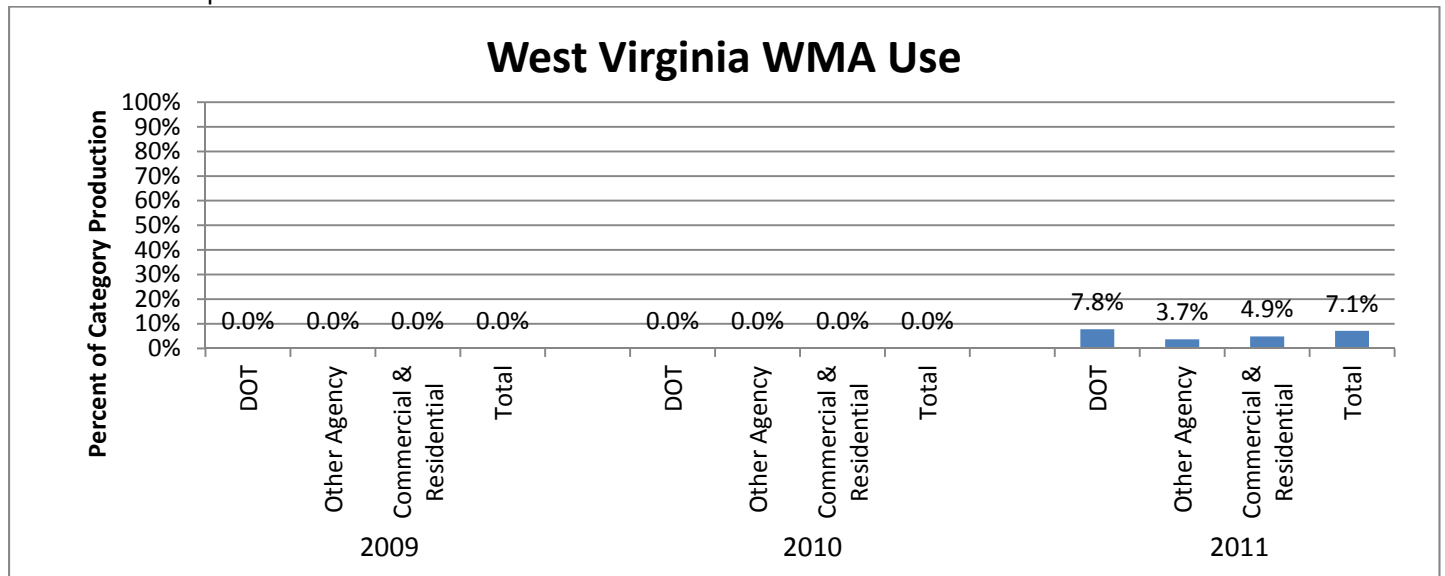


Table B 49: Summary of West Virginia Data for 2011

Companies Reporting

3

<b>HMA/WMA</b>		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	1,656,110	2,961,262
Total Other Agency Tonnage	138,735	248,070
Total Commercial & Residential Tonnage	302,373	540,668
Total Tonnage	2,097,218	3,750,000
<b>Reclaimed Asphalt Pavement (RAP)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	221,291	395,687
RAP Tons used in HMA/WMA	222,149	397,221
RAP Tons used as Aggregate	25,500	45,596
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	10%	
Average % RAP in Other Agency Mixes	5%	
Average % RAP in Commercial & Residential Mixes	12%	
<b>Reclaimed Asphalt Shingles (RAS)</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	0%	
RAS Tons Received	-	-
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
<b>Warm-Mix Asphalt</b>		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	67%	
WMA DOT Tonnage	129,275	231,155
WMA Other Agency Tonnage	5,085	9,092
WMA Commercial & Residential Tonnage	14,744	26,364
Total WMA Tonnage	149,104	266,611
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

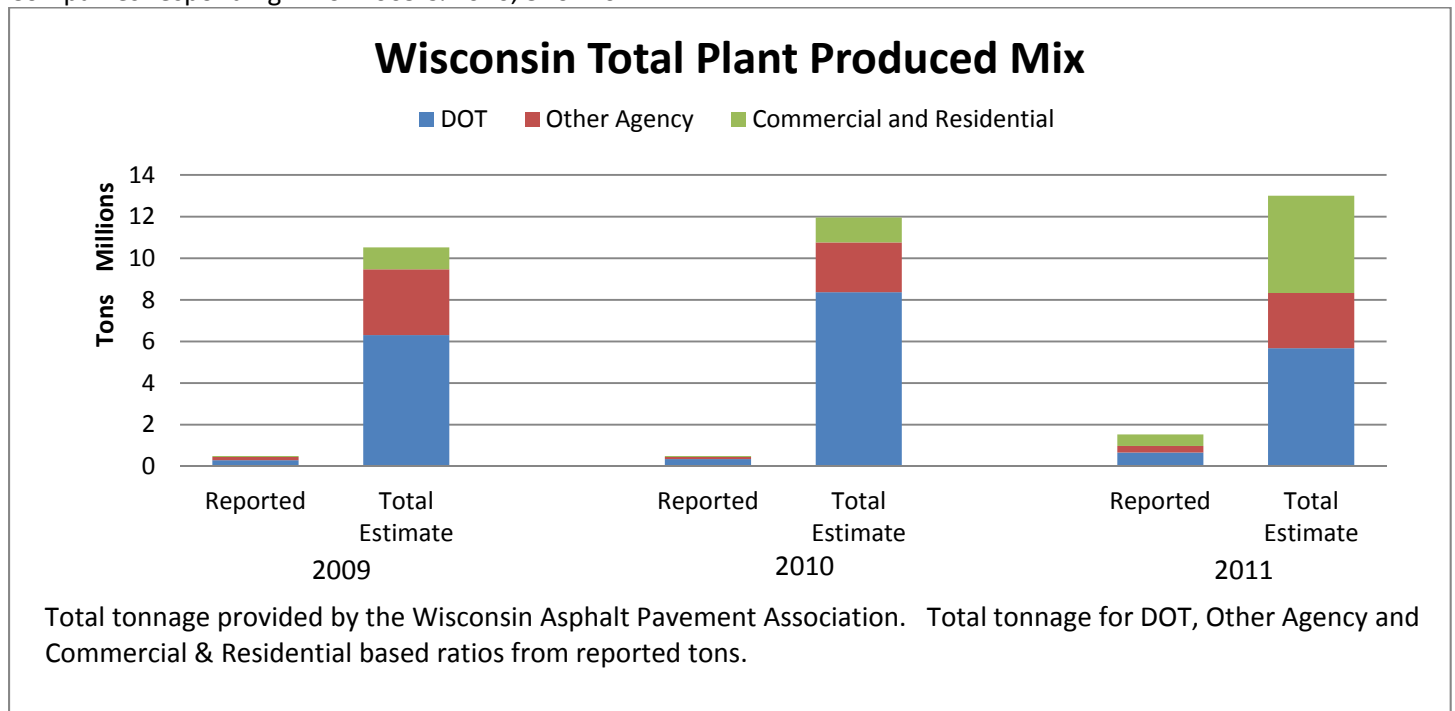
1. Total tonnage provided by the West Virginia Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Wisconsin

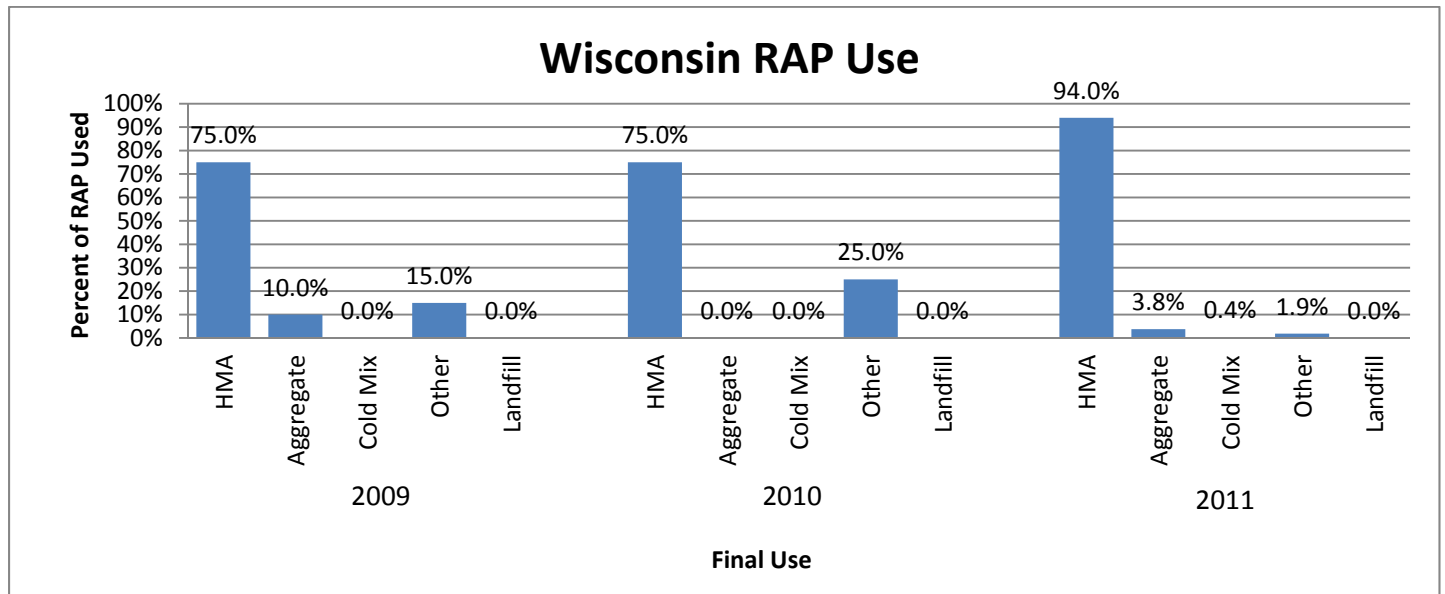
Table B51 summarizes the results received from asphalt mix producers in Wisconsin. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 1 for 2009 & 2010, 3 for 2011

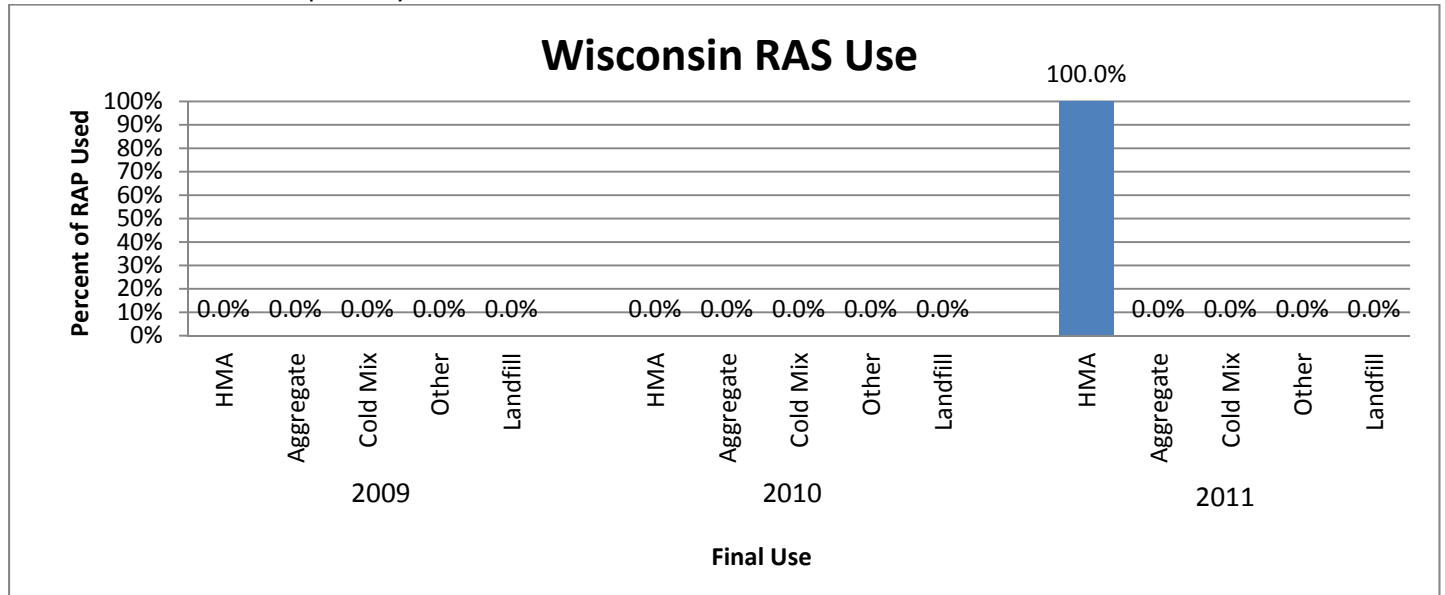


### RAP Use



## RAS Use

The contractor did not report any RAS use in 2009 or 2010.



## WMA Use

The contractor did not report any WMA use in 2009 or 2010.

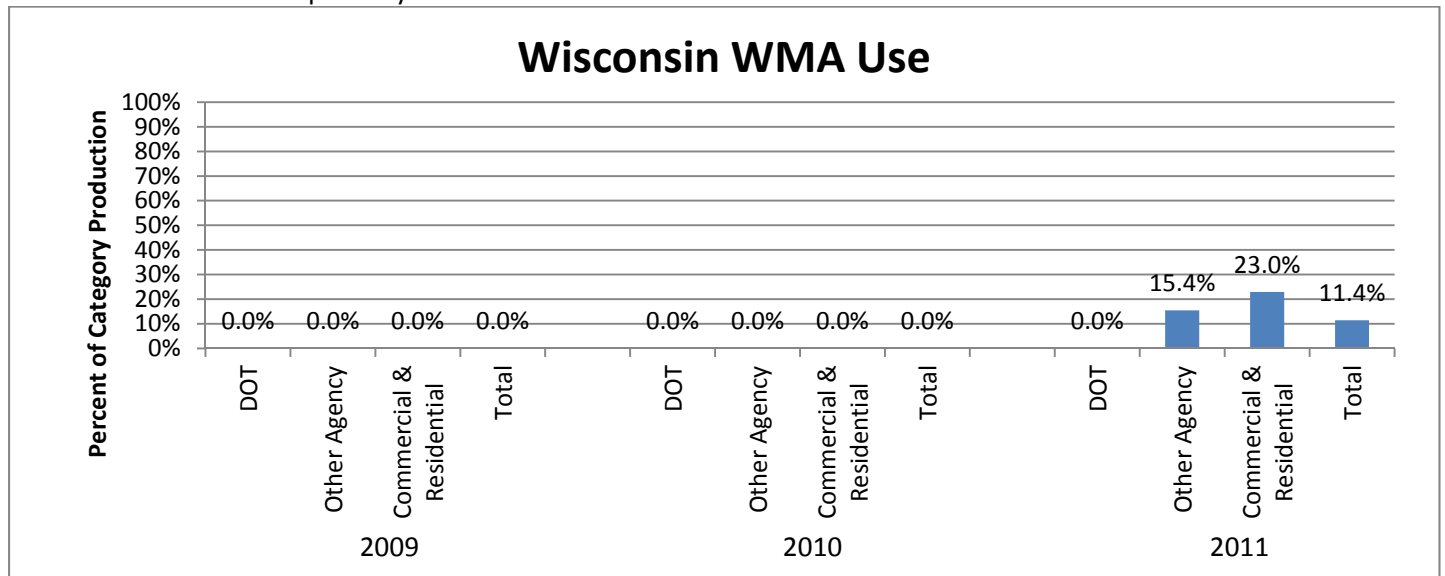


Table B 50: Summary of Wisconsin Data for 2011

# Wisconsin

Companies Reporting

3

HMA/WMA		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	669,500	5,674,469
Total Other Agency Tonnage	313,300	2,655,431
Total Commercial & Residential Tonnage	551,000	4,670,100
Total Tonnage	1,533,800	13,000,000
Reclaimed Asphalt Pavement (RAP)		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	345,000	2,924,110
RAP Tons used in HMA/WMA	249,400	2,113,835
RAP Tons used as Aggregate	10,000	84,757
RAP Tons used in Cold Mix	1,000	8,476
RAP Tons used as Other	5,000	42,378
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	17%	
Average % RAP in Other Agency Mixes	17%	
Average % RAP in Commercial & Residential Mixes	15%	
Reclaimed Asphalt Shingles (RAS)		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	100%	
RAS Tons Received	31,500	266,984
RAS Tons used in HMA/WMA	25,200	213,587
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	1%	
Average % RAS in Other Agency Mixes	2%	
Average % RAS in Commercial & Residential Mixes	3%	
Warm-Mix Asphalt		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	67%	
WMA DOT Tonnage	-	-
WMA Other Agency Tonnage	48,365	409,926
WMA Commercial & Residential Tonnage	126,500	1,072,174
Total WMA Tonnage	174,865	1,482,100
Percent WMA Tons using Chemical Additives	7.9%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	92.1%	
Percent WMA Tons using Organic Additive	0.0%	

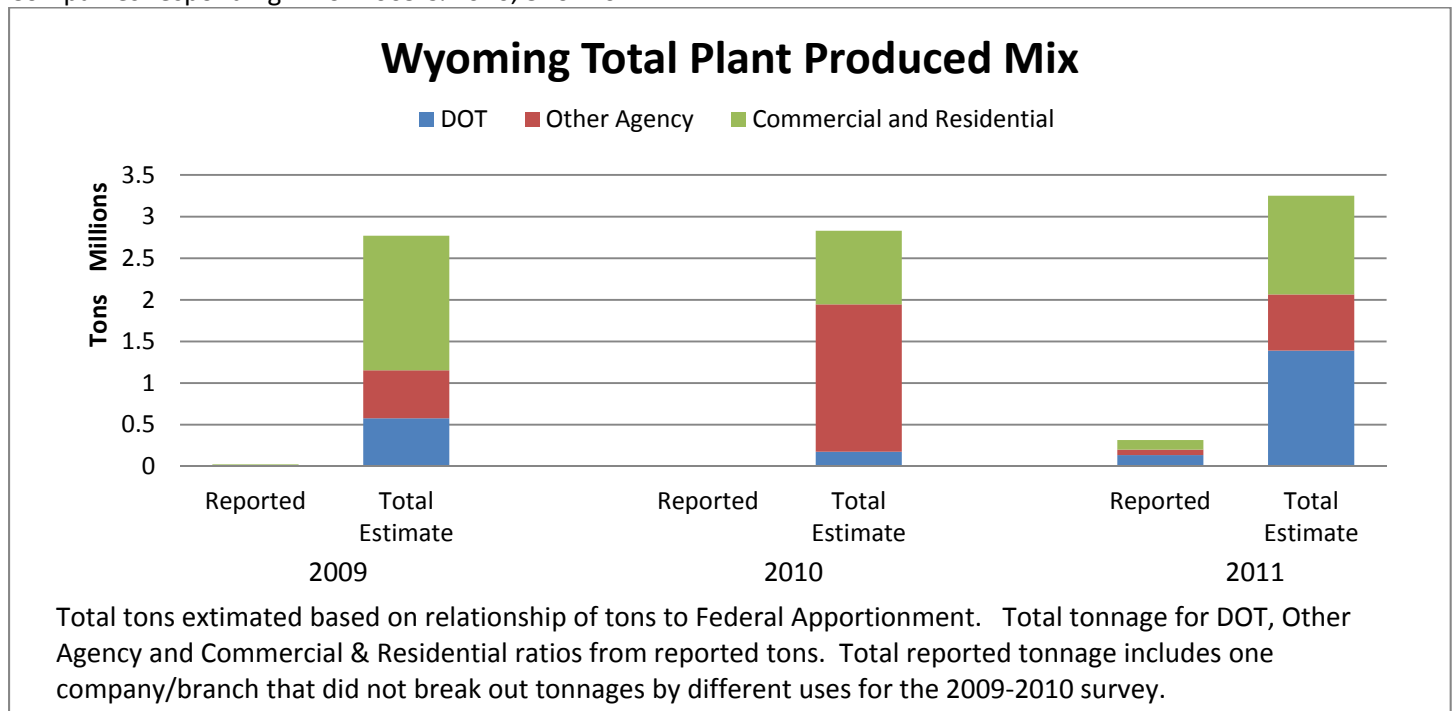
1. Total tonnage provided by the Wisconsin Asphalt Pavement Association. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.

## Wyoming

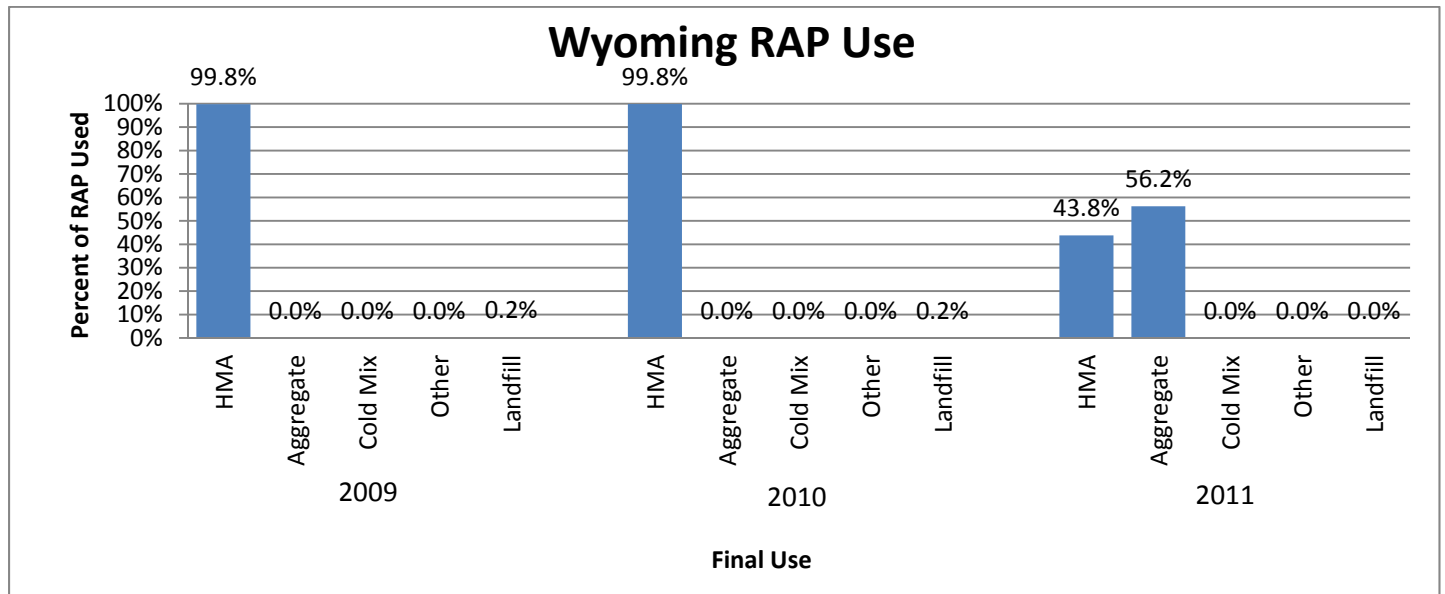
Table B52 summarizes the results received from asphalt mix producers in Wyoming. The charts are used to summarize statistics calculated from information provided by the survey respondents.

### Total Asphalt Mix Tonnage

Companies responding: 2 for 2009 & 2010, 3 for 2011



### RAP Use



### RAS Use

No contractor reported using RAS in 2009, 2010 or 2011. One company reported receiving RAS in 2011 but did not report its use.



## WMA Use

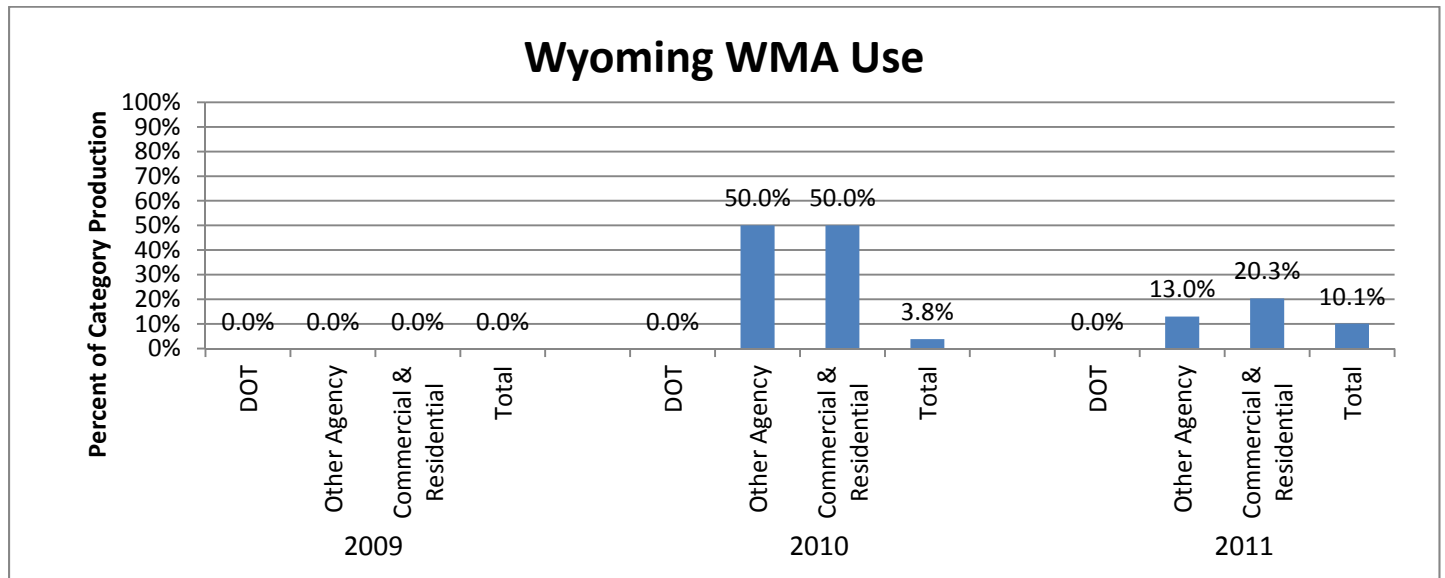


Table B 51: Summary of Wyoming Data for 2011

Companies Reporting

3

HMA/WMA		
	Reported	Total Estimated <sup>1</sup>
	2011	2011
Total DOT Tonnage	135,590	1,391,358
Total Other Agency Tonnage	65,610	673,258
Total Commercial & Residential Tonnage	115,615	1,186,384
Total Tonnage	316,815	3,251,000
Reclaimed Asphalt Pavement (RAP)		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAP	100%	
RAP Tons Received	31,795	326,265
RAP Tons used in HMA/WMA	4,208	43,179
RAP Tons used as Aggregate	5,400	55,412
RAP Tons used in Cold Mix	-	-
RAP Tons used as Other	-	-
RAP Tons Landfilled	-	-
Average % RAP in DOT Mixes	0%	
Average % RAP in Other Agency Mixes	1%	
Average % RAP in Commercial & Residential Mixes	5%	
Reclaimed Asphalt Shingles (RAS)		
	Reported	Total Estimated
	2011	2011
Percent Companies using RAS	33%	
RAS Tons Received	1,150	11,801
RAS Tons used in HMA/WMA	-	-
RAS Tons used as Aggregate	-	-
RAS Tons used in Cold Mix	-	-
RAS Tons used as Other	-	-
RAS Tons Landfilled	-	-
Average % RAS in DOT Mixes	0%	
Average % RAS in Other Agency Mixes	0%	
Average % RAS in Commercial & Residential Mixes	0%	
Warm-Mix Asphalt		
	Reported	Total Estimated
	2011	2011
Percent Companies using WMA	100%	
WMA DOT Tonnage	-	-
WMA Other Agency Tonnage	8,531	87,536
WMA Commercial & Residential Tonnage	23,520	241,352
Total WMA Tonnage	32,051	328,888
Percent WMA Tons using Chemical Additives	0.0%	
Percent WMA Tons using Additive Foaming	0.0%	
Percent WMA Tons using Plant Foaming	100.0%	
Percent WMA Tons using Organic Additive	0.0%	

1. Total tons estimated based on relationship of tons to Federal Apportionment. Total tonnage for DOT, Other Agency and Commercial & Residential ratios from reported tons.