



Association of Modified Asphalt Producers

## **2019 MARKET SURVEY RESULTS**

September 2020

[modifiedasphalt.org](http://modifiedasphalt.org)

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## CHAPTER 1: OVERVIEW OF SURVEY EFFORTS

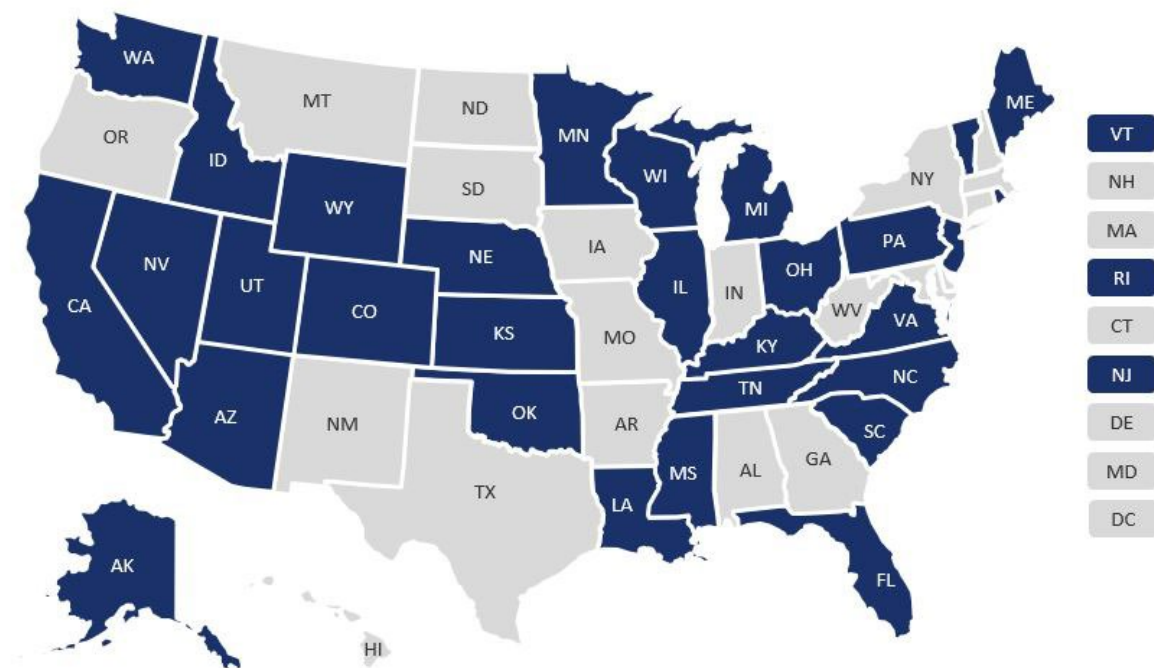
### Distributions and responses

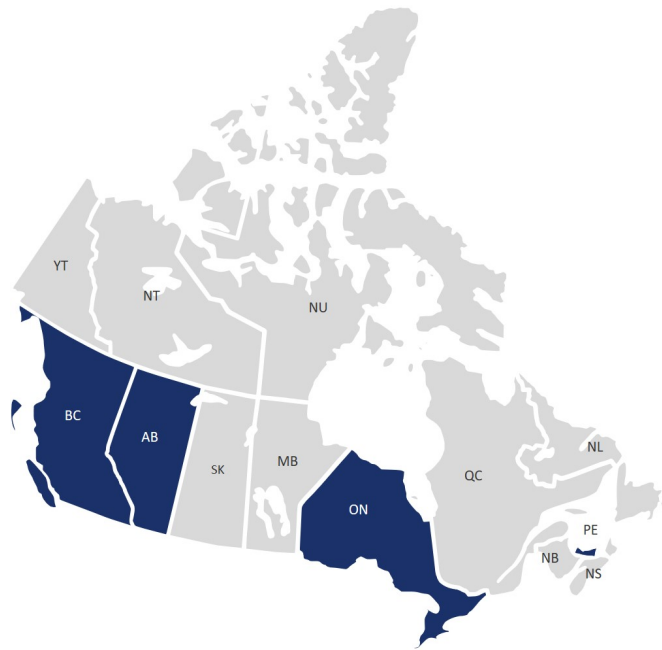
In 2019, the Association of Modified Asphalt Producers (AMAP, [modifiedasphalt.org](https://www.modifiedasphalt.org)) conducted two surveys about the modified asphalt market.

- One survey was conducted among producers of modified asphalt, referred to in this report as the **producers survey**.
- A second survey was conducted among state departments of transportation, referred to here as the **DOT survey**. This survey was sent to representatives of all 50 states, the District of Columbia, and all 10 Canadian provinces.

The **producers survey** was sent to representatives of 120 companies that use asphalt modifier in their products. Recipients included companies that are AMAP members as well as those that choose not to be members. AMAP aimed for complete participation in the survey producers of modified asphalt in North America. From among these 134 companies, 32 responded (24%).

The **DOT survey** was sent to representatives of all U.S. states, the District of Columbia, and all Canadian provinces. AMAP received responses from 30 states (60%) and 1 province (10%).





## Survey results

The **producers survey** discusses products, markets, and other topics that individual companies may be reluctant to discuss publicly. To promote broad participation, respondents to this survey were granted anonymity in their responses.

Therefore, the complete results of the producers survey will not be published. Instead, this publication provides an overview of responses and highlights key answers. Please see **Chapter 2: Producers Survey Results** and **Chapter 4: How Do Producers and State Compare**.

The **DOT survey** was conducted with the intention of publishing the complete survey data set. The data can be accessed from a [spreadsheet published on AMAP's website](#). In addition, highlights of the results are discussed in this report. Please see **Chapter 3: DOT Survey Results** and **Chapter 4: How Do Producers and State Compare**.

## CHAPTER 2: PRODUCER SURVEY RESULTS

Key responses and observations from the results of the producer survey are presented in this chapter. Among highlighted findings:

- The range of the polymer market use among respondents in 2019 was 160 to 220 million pounds.
- The most common application for modifiers was asphalt binders.
- The most commonly used polymer modifier (by tonnage used) for pavement companies was SBS linear, for roofing companies was a tie (SBS linear and SBS radial); and for filler companies was SBS radial.
- The most common used non-polymer modified (by tonnage used) for pavement companies was a tie between cross linkers and PPA; for roofing companies was extenders; and for filler companies was fibers.
- Producers saw on average a 3 to 4% market growth in 2019 and projected a 2 to 3% average growth for 2020. A change in demand was the most common reason for market growth.
- The most common reasons for modification are to meet specifications or road agency requirements.
- Producers have a generally positive opinion about their vendors regarding value of products and services, technical support, and offering of improved products.

Summaries of individual questions and numerical responses follow. Survey questions are presented in *italic lettering*.

### Polymer use

*Q: In pounds, how much polymer of any type will your company use in total in 2019 across all of your North American locations?*

Respondents could provide answers in bins of increasing size (less than one million, one to three million, etc.) as shown in the table below. To protect anonymity of respondents, the precise number of respondents per bin is not reported here. However, the most common response among the 27 respondents reported use in the range of one to three million pounds.

Pounds (millions)	Respondents (n = 27)
Less than 1	<b>Most common</b>
1 to 3	
3 to 6	
6 to 9	
9 to 12	
12 to 15	
15 to 18	
18 to 21	
More than 21	

Bottom end  
**160 million pounds of polymer**

Top end  
**220+ million pounds of polymer**

Moreover, we can establish a range by calculating each respondent at the bottom end of each bin (resulting in a total market size of 160 million pounds of polymer) and at the top end (resulting in a total market size of more than 220 million pounds).

### Nonpolymer use

*Q: In pounds, how much nonpolymer of any type will your company use in total in 2019 across all of your North American locations?*

Respondents could provide answers in bins of increasing size (less than one million, one to three million, etc.) as shown in the table below. To protect anonymity of respondents, the precise number of respondents per bin is not reported here. However, the most common response among the 27 respondents reported use of less than one million pounds.

Pounds (millions)	Respondents (n = 27)
Less than 1	<b>Most common</b>
1 to 3	
3 to 6	
6 to 9	
9 to 12	
12 to 15	
15 to 18	
18 to 21	
More than 21	

Bottom end  
**65 million pounds of nonpolymer**

Top end  
**100+ million pounds of nonpolymer**

Again, we can establish a range by calculating each respondent at the bottom end of each bin (resulting in a total market size of 65 million pounds of polymer) and at the top end (resulting in a total market size of more than 100 million pounds).

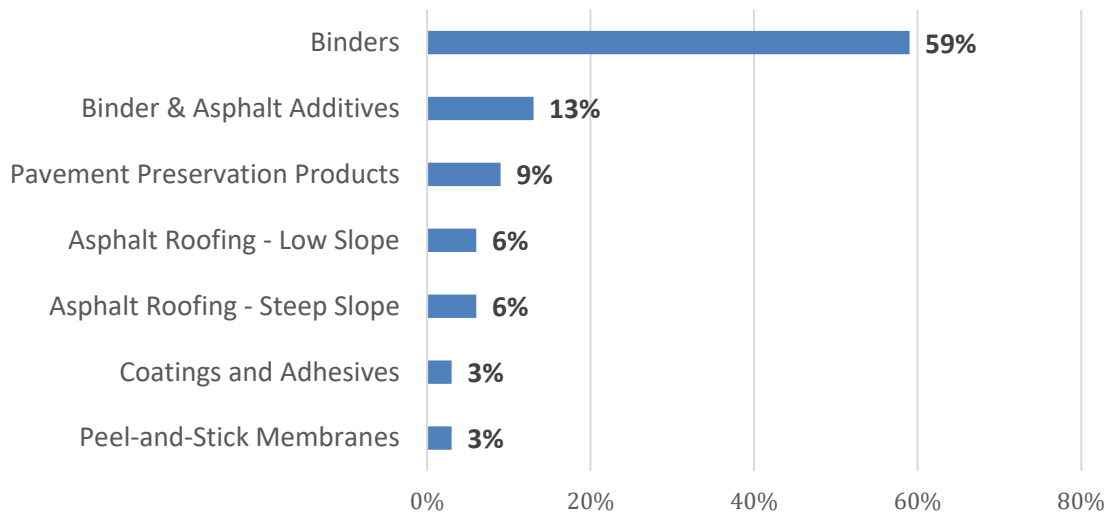
## Market segments

*Q. Indicate the market segments where your company sells modified asphalt product.*

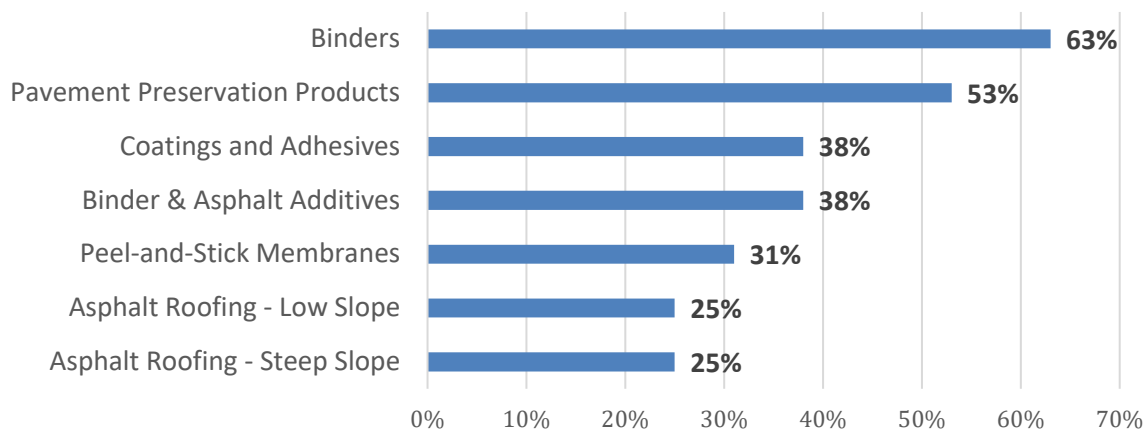
Respondents ranked a list of choices (binders, crack fillers, etc. as listed below) from 1 (largest market segment) to as high as 8 (smallest market segment). Respondents could leave unranked markets they did not serve.

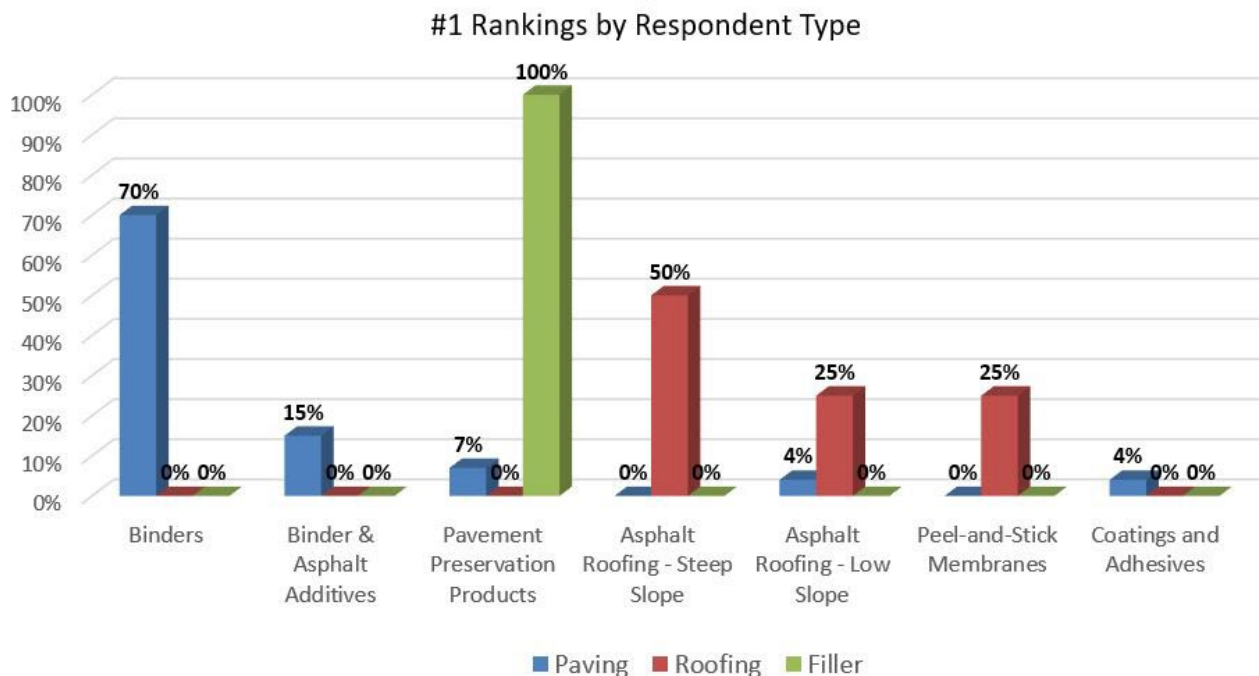
The most common #1-ranked market was binders. The most common market assigned any ranking at all was binders. When rankings were identified by types of companies, paving respondents listed “binders” (70%) as the top-ranked market, roofing respondents listed “asphalt roofing - steep slope” (50%), and filler respondents listed “pavement preservation products” (100%) as the top-ranked market.

#1 Rankings



Any Ranking





## Polymer modifiers

*Q. Rank by tonnage the types of polymer modifiers your company expects to use in 2019.*

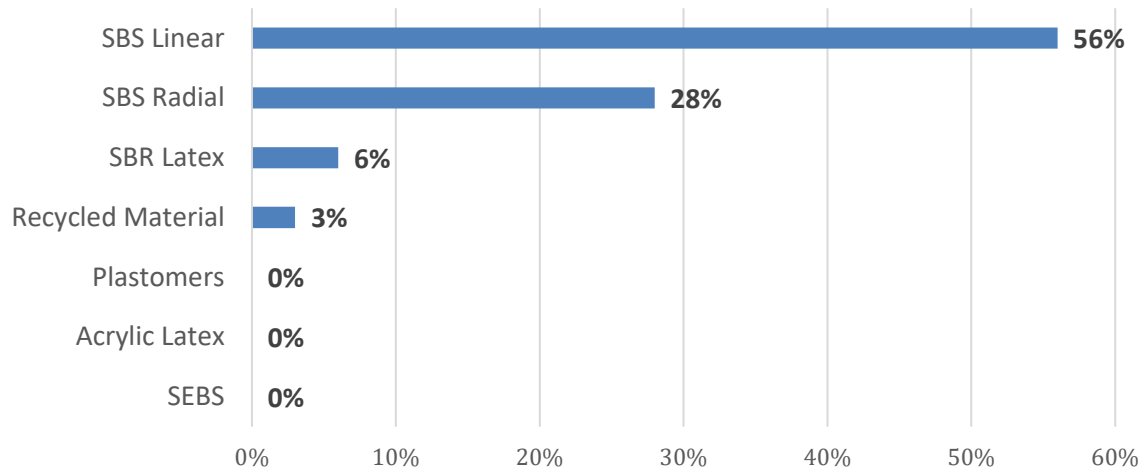
Respondents ranked a list of choices (SBS linear, SBS radial, etc. as listed below) where 1 was the greatest tonnage expected in 2020. Respondents were asked to leave the answer blank on any modifiers the company does not use.

The most common highest-tonnage polymer modifier was SBS linear, noted by 56% of respondents. The most common second-highest-tonnage polymer modifier was SBS radial, noted by 28% of respondents. The most common ranked polymer modifier was SBS linear, noted by 91% of respondents.

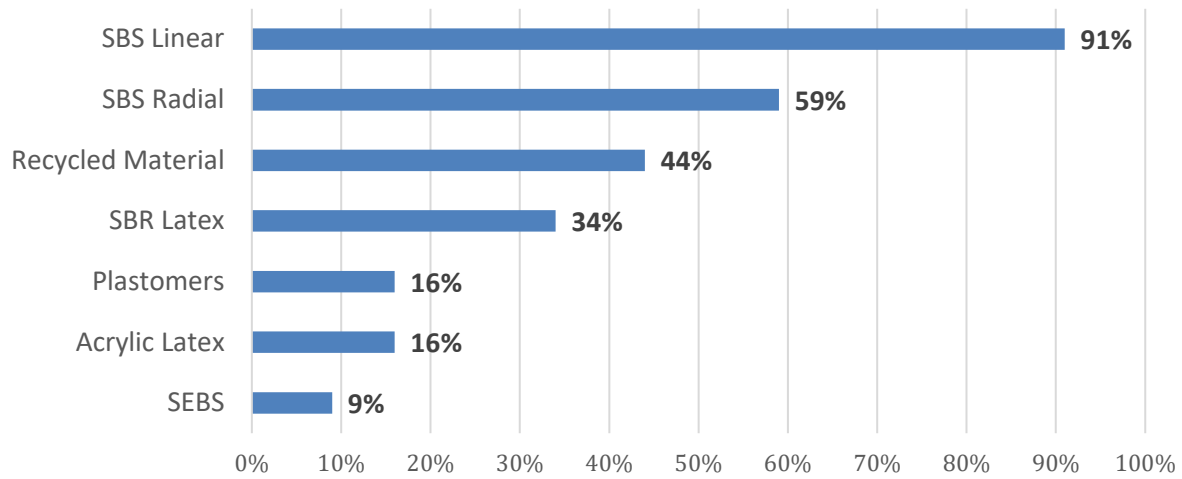
The top market segments of the respondents (see the previous question) was considered, and respondents grouped them into three coarse categories: **pavement companies, roofing companies, and filler companies**. When this question was examined just for these three groups, the most common modifier by tonnage for pavement companies was SBS linear (59%), for roofing companies was equal for SBS linear and SBS radial (50%), and the most common for filler companies was SBS radial (100%).

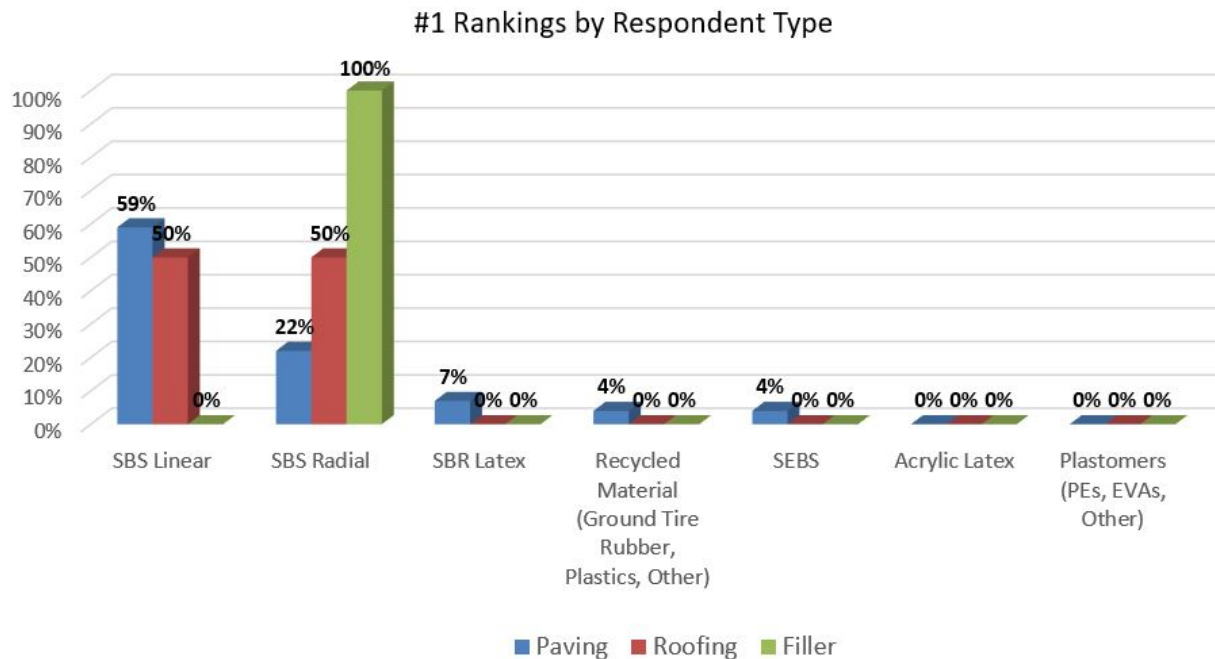


### #1 Rankings



### Any Ranking





## Nonpolymer modifiers

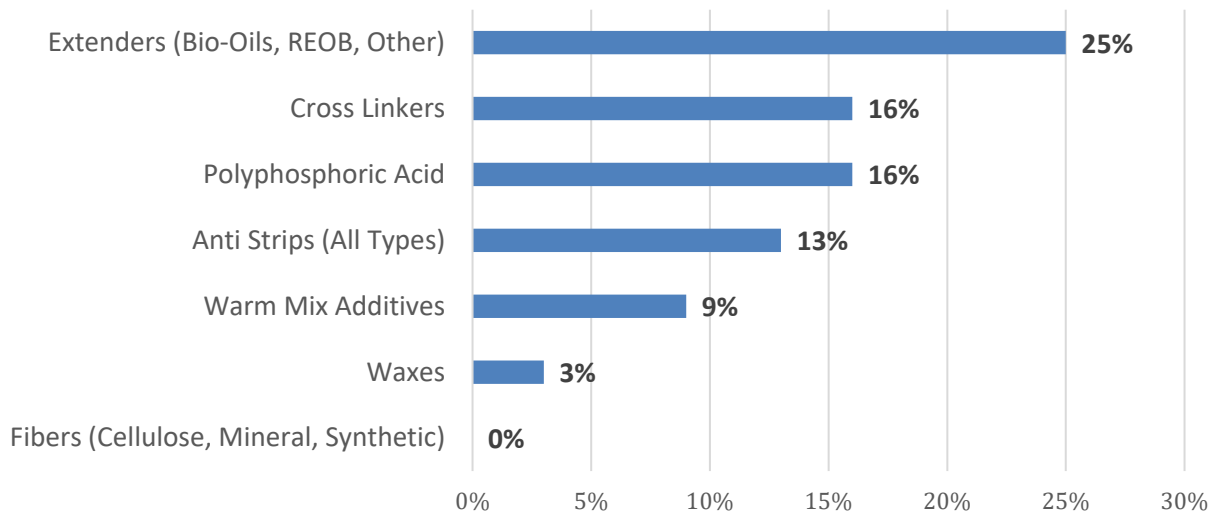
*Q. Rank by tonnage the types of nonpolymer modifiers your company expects to use in 2019.*

The same type of question was posed for nonpolymer modifier, with the choices as listed below.

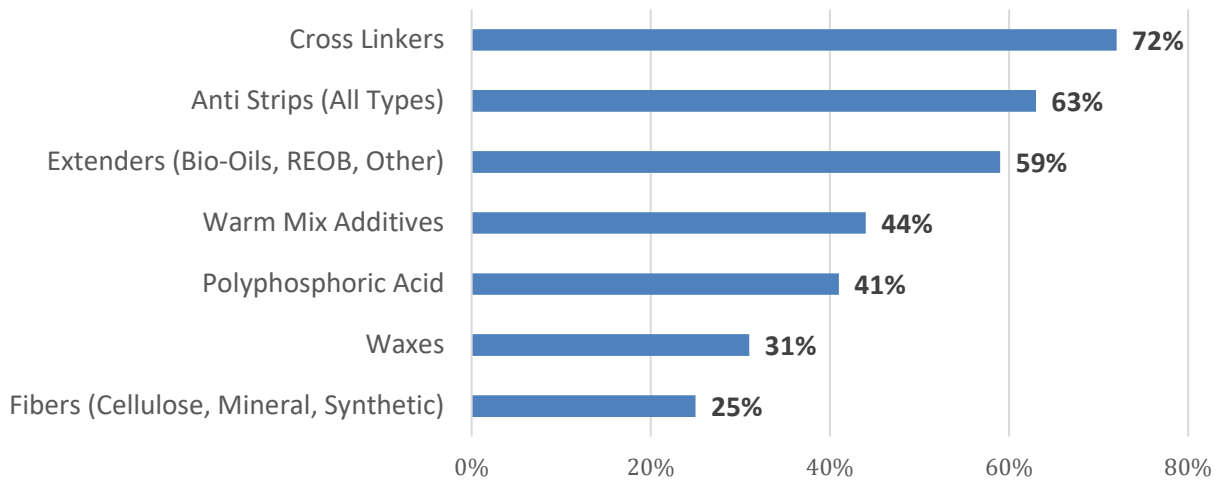
The most common highest-tonnage nonpolymer modifier was extenders receiving 25% of responses. The common second-highest-tonnage nonpolymer modifier was equal between cross linkers and polyphosphoric acid (PPA) each receiving 16% of responses. The most common ranked nonpolymer modifier was cross linkers, noted by 72% of respondents.

Again, responses were parsed for pavement, roofing and filler companies. The most common modifier by tonnage for pavement companies was a tie with cross linkers and PPA each receiving 23%, for roofing companies was extenders receiving 100%, and the most common for filler companies was fibers receiving 100%.

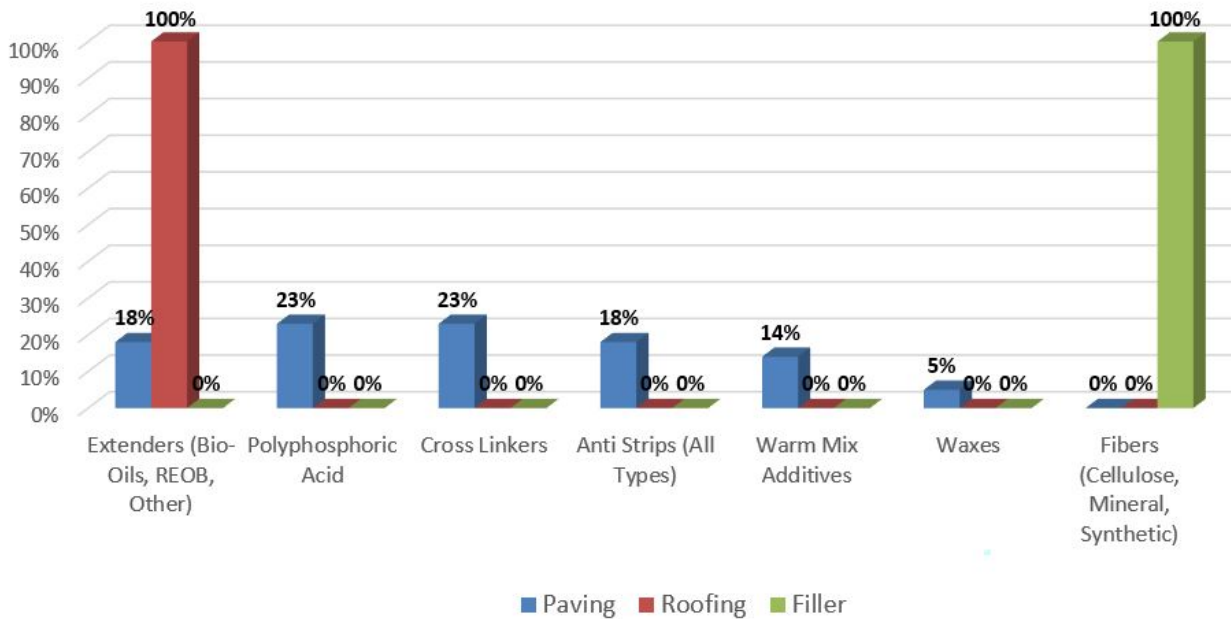
### #1 Rankings



### Any Ranking



#1 Rankings by Respondent Type



## Market growth

*Q. How do you expect your company's sales of modified asphalt product to change from 2018 to 2019? From 2019 to 2020 (projected)?*

For both the current and following year, respondents indicated a projected increase or decrease by percentage value, or indicated a projection of no change.

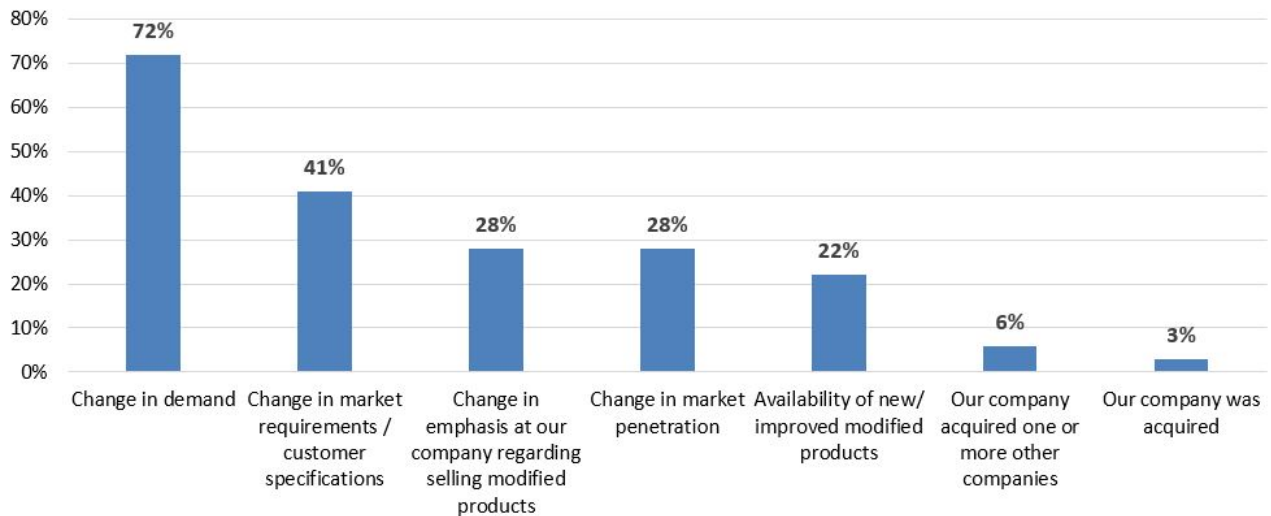
For both years (from 2018 to 2019 and from 2019 to 2020) about 53 to 63% of respondents expect sales of modified asphalt products to increase. An estimated 31 to 37% of respondents expect sales to remain the same. Overall, the data indicated a market growth of about 2.7%, a slight decrease from the previous year.

Period	2018 to 2019	2019 to 2020	(2017 to 2018)	(2018 – 2019)
<b>Decrease</b>	10% of respondents	6%	4%	2%
<b>Stay the Same</b>	37% of respondents	31%	36%	42%
<b>Increase</b>	<b>53% of respondents</b>	<b>63%</b>	60%	56%
<b>Range</b>	-30% to 20% growth	-50% to 20%	-10% to 50%	-10% to 43%
<b>Average</b>	<b>3.6% growth</b>	<b>2.7%</b>	6.0%	5.0%

## Market forces

*Q. What market forces are influencing these changes in 2019 and 2020? Select all that apply.*

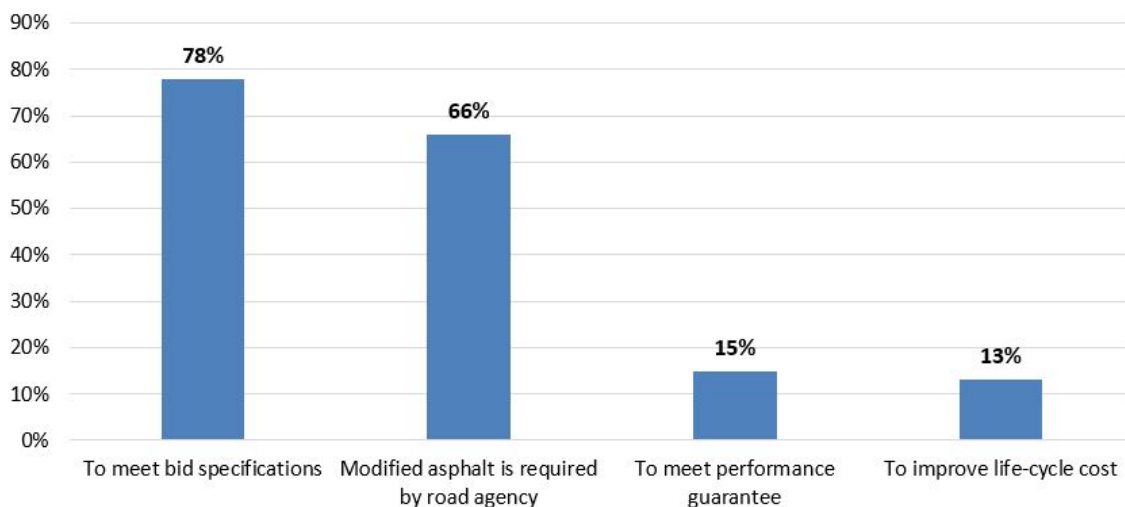
Respondents indicated one or more market forces driving their companies' change in sales. Change in demand was the most commonly reported market force influencing market growth. This was the top choice in 2018 as well, selected by 59% of respondents.



## Why modify

*Q. Why does your company (or why do your customers) choose to modify asphalt? Select all that apply.*

Respondents offered their opinions on why they (or their customers) choose to modify, selecting one or more of the options below. The most common responses were to meet bid specifications (78% of respondents) and because modified asphalt was required by the road agency (66% of respondents).



Among other reasons offered as free-responses was:

- Customer choice
- More profitable than nonmodified binders

## Thoughts about vendors

*Q. Indicate your agreement or disagreement with each of these statements about the vendors who supply modifiers to your company. (5 = Strongly Agree to 1 = Strongly Disagree)*

Respondents offered their opinions about vendors stating their agreement on a five-point scale (5 = strongly agree to 1 = strongly disagree). Respondents generally agreed, averaging between 3.8 and 3.9 points, with three positive statements about vendors regarding value, technical support, and offering of improved products.

Statement	Average Response	2018
Our vendors provide good value for products and services provided.	3.8	4.0
Our vendors provide excellent technical support.	3.9	3.8
Our vendors continue to provide improved products to meet our needs.	3.6	3.8

## CHAPTER 3: DOT SURVEY RESULTS

The DOT survey results are published in their entirety. Therefore, this report does not report numbers in as much detail as Chapter 2.

Full responses may be found at <http://www.modifiedasphalt.org/download/6966/>.

However, the following summary observations are offered:

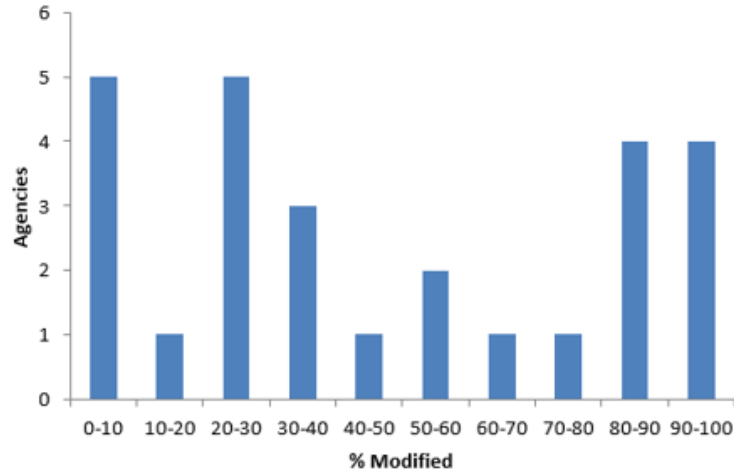
- Responding agencies reported on asphalt use by tonnage in 2018, 2019 and (projected) 2020. On average, little change was reported from 2018 to 2019 (1%), but a decrease of 2% in use by tonnage was anticipated from 2019 to 2020.

	2018	2019	2020	% change 2018 – 19	(Decrease/ Stable/ Increase)	Projected % change 2019 – 20	(Decrease/ Stable/ Increase)
<b>Million tons</b>	79.5	80.1	78.2	1%	10 / 4 / 15	-2%	13 / 6 / 10
<b>Pro-rated to all states</b>	144	145	141	(Based on 28 states representing 53% of flexible roads per FHWA table HM31R)			

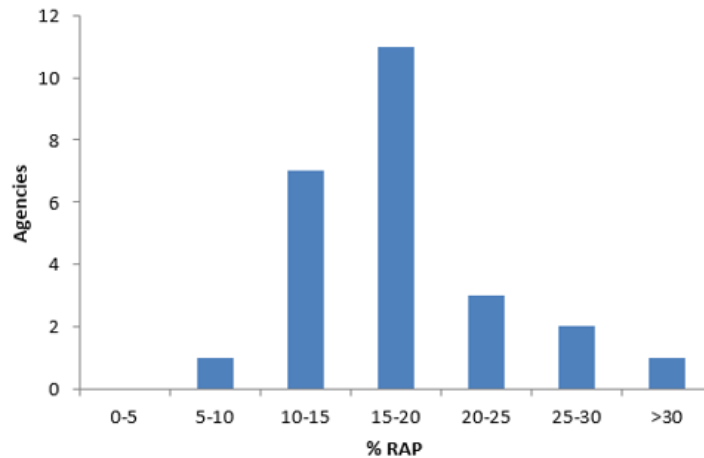
- Responding agencies similarly reported on liquid binder tonnages. Little change was reported from 2018 to 2019 (-1%) or projected from 2019 to 2020 (-1%).

	2018	2019	2020	% change 2018 – 19	(Decrease/ Stable/ Increase)	Projected % change 2019 – 20	(Decrease/ Stable/ Increase)
<b>Million liquid tons</b>	3.53	3.50	3.47	-1%	10 / 4 / 10	-1%	11 / 7 / 6
<b>Pro-rated to all states</b>	7.89	7.78	7.71	(Based on 23 states representing 43% of flexible roads per FHWA table HM31R)			

- There was a high variance among agencies on what percent of asphalt binder used is modified. The following graph from 2019 is typical. The average is in the high 40% range, but this statistic doesn't adequately capture the spread of values, with many agencies at both the low and high ends and few in the middle.



- RAP use for surface courses is nearly identical for the years 2017, 2018, and 2019. The average is 20% with a median range of 15 to 20%.



- SBS linear was the most commonly used polymer modifier in 2019. A change from 2018 where SBS radial was the most commonly used polymer modifier.

Modifier	SBS Linear	SBS Radial	Recycled Material: Ground Tire Rubber	Other*	SBR Latex	Plastomers	SEBS	Acrylic Latex	Recycled Material: Plastics	None
Agencies	18	15	15	15	13	2	1	1	1	1
Most common in 2018										



- Warm-mix additives were the most commonly used nonpolymer modifier in both 2018 and 2019.

Modifier	Warm Mix Additives	Anti Strips	Fibers	PPA	Other*	Cross Linkers	Waxes	Rejuvenators / Rejuvenator-Sealers	Extenders (Bio-Oils, REOB)	None
Agencies	24	20	13	10	9	5	3	2	1	0

\*Other:

- Again, performance-based
- Some agencies restrictions coal ash or REOB

- 52% of responding agencies require modification always or sometimes, compared to 65% from the previous year. 36% specify the type of modifier to be used, a decrease from 2018 of 57%.

Response	Specify that modification is required?	Specify the type of modifier to be used?	Specify the percent of modifier to be used?	Test for separation?
Yes	42%	23%	6%	42%
Sometimes	10%	13%	6%	n/a
No	48%	65%	87%	58%

- 84% of respondents indicated the asphalt binder pricing changed their agency's paving plan in 2019.
- 77% of respondents indicated that their agency includes, or plans to include, additional tests for PG Binder Specifications (typically referred to as PG Plus or SHRP Plus) to ensure that modifiers are used. The most common tests were DSR Multiple Stress Creep Recovery (MSCR) (16 respondents), elastic recovery (13), and DSR phase angle (8). The results are nearly identical to 2018.

Binder Test	DSR MSCR	Elastic Recovery	DSR Phase Angle	Other	Toughness and Tenacity	Forced Ductility	Direct Tension
Respondents	16	13	8	3	3	3	1

- A majority of respondents indicated that modified asphalt was "important" or "very important" to prevent rutting (97% of respondents), fatigue (87%) and low temperature thermal cracking (74%).

Problem	% of Respondents	2018
Rutting	97%	94%
Fatigue	87%	91%
Low temperature thermal cracking	74%	63%
Offsetting increased RAP use	29%	39%

- A majority of respondents indicated that they were "satisfied" or "very satisfied" with respect to modified asphalt's life cycle cost (68% of respondents) and service (71%) and with respect to warm mix (48%).

Aspect	% of Respondents	2018
Life cycle cost	68%	68%
Service life	71%	67%
Warm mix	48%	53%

## CHAPTER 4: HOW DO PRODUCERS AND DOTs COMPARE?

AMAP asked producers and DOTs questions about their five-year outlook on topics related to modified asphalt. These questions were worded nearly identically, in a few cases with phrasing changed as appropriate for either recipient group (e.g., "the products we sell" versus "the products we use").

In this manner, AMAP was able to conduct an apples-to-apples comparison between the outlook of the producers in the modified asphalt industry and the agencies that use modified asphalt. Questions were asked in the areas of **market trends** and **market drivers**.

### Market Trends Outlook

*Q. Looking at the next five years, indicate your agreement or disagreement with each of these statements about market trends. (5 = Strongly Agree to 1 = Strongly Disagree)*

For each of the five statements below, the percentages indicate the respondents who either "strongly agree" or "agree." The magnitude of the difference between the producer respondents and DOT respondents ( $|\delta|$ ) appears in the fourth column. The magnitude of difference in the 2018 survey appears in the fifth column.

- Responses show a significant disagreement between producers and DOTs in all areas of market trends except for warm mix binders growth (question 3).
  - Producers were more bullish on growth of recycle material use (question 1), polymer modified asphalt use (question 2), and the role of bio-based products (question 4).
  - Producers were also more likely to believe than DOT respondents that the use asphalt products will displace more concrete (question 5).
  - There was generally more agreement between producers and DOTs in 2018 compared with 2019 (note the smaller  $|\delta|$  down the far right column).

Statement	Producers	DOTs	$ \delta $	2018 $ \delta $
Use of <b>recycled materials</b> will continue to grow.	82%	61%	21%	2%
Use of <b>polymer modified asphalt</b> products will continue to grow.	88%	64%	24%	14%
<b>Warm mix binders</b> will continue to grow.	60%	52%	8%	2%
<b>Bio-based products</b> will play a more important role in our products.	63%	32%	31%	33%
For paving, <b>asphalt products will displace more concrete</b> .	56%	21%	35%	1%

## Market Drivers Outlook

*Q. Looking at the next five years, indicate your agreement or disagreement with each of these statements about market drivers. (5 = Strongly Agree to 1 = Strongly Disagree)*

Again, for each of the four statements below, the percentages indicate the respondents who either "strongly agree" or "agree." The magnitude of the difference between the producer respondents and DOT respondents ( $|\delta|$ ) appears in the fourth column. The magnitude of difference in the 2018 survey appears in the fifth column.

- Producers were in agreement with DOTs in 2019 to believe that asphalt will be readily available (question 2). In 2018, DOTs were more likely to believe that.
- Responses also show agreement between producers and DOTs about how new technologies will change products (question 3).
- However, there was a difference regarding how government regulations will change how business is done (question 1). The disparity is logical: Government regulations will impose a change on producers, whereas the DOTs are the ones who are imposing the changes.
- Producers were also more likely to believe that VTAE/REOB will continue to play a role in asphalt modification (question 4).

Statement	Producers	DOTs	$ \delta $	2018 $ \delta $
<b>Government regulations</b> will change the way we do business. <i>(Reverse wording for DOTs)</i>	67%	45%	22%	60%
Asphalt will be <b>readily available</b> .	67%	67%	0%	30%
<b>New technologies</b> will change the product we sell. <i>(or "use" for DOTs)</i>	63%	73%	10%	6%
Vacuum tower asphalt extender ( <b>VTAE</b> ) / re-refined engine oil bottom ( <b>REOB</b> ) will continue to <b>play a role in asphalt modification</b> .	41%	22%	19%	35%