



Modified Asphalt Market Survey 2004 Revised

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Malvern Instruments

The Association of Modified Asphalt Producers Meeting

May 1, 2004



Modified Asphalt Survey

- Review DOT Survey
- Review DOT Survey Results
- Review (Last Year) 2003 Usage Forecast
- Actual Reported Usage in 2003
- Forecast 2004 Modified Usage

Name:		Phone:	
Title:		Fax:	
Mailing Address:		E-Mail:	
City:	State:	Zip:	

1. Asphalt Binder Use

- How many liquid tons of **Binder** was let in 2003? _____ PG liquid tons
 _____ AC liquid tons
- How much of that was **MODIFIED BINDER**? _____ PG liquid tons
 _____ AC liquid tons
- Was this *more* or *less* **Modified** from 2002? _____ more _____ less
- Do you expect *more* or *less* **Modified** in 2004? _____ more* _____ less
 * If more, estimated increase in liquid tons? _____ liquid tons
- Do you expect to use *more* or *less* **Binder** in 2004? _____ more _____ less

2. Does your State specify modifier and/or percentage of modifier to be included in the binder? _____ Yes _____ No

and/or

To meet a specified grade is modification required? _____ Yes _____ No

3. Check all the Modifiers used in your State?

- a. SBS _____
 - b. SB _____
 - c. SBR _____
 - d. Latex _____
 - e. Other Polymer Modifier _____ Type: _____
 - f. Chemical Modifier _____ Type: _____
 - g. Other Modifier _____ Type: _____
- [[if known list type(s)]]*

4. Does your State test for stability or separation? _____ Yes* _____ No

* If Yes, which test(s) do you use? _____

5. What are the most common Modified Asphalt grades used in your State?

- a. _____
- b. _____
- c. _____
- d. _____

6. Does your State include, or plan to include, additional tests for PG Binder Specifications (typically referred to as PG Plus or SHRP Plus) to ensure Modifiers are used to improve asphalt binder performance? _____ Yes* _____ No

* **If YES...Check all that apply** (please describe specification)

- a. DSR Phase Angle _____
- b. Direct Tension _____
- c. Elastic Recovery _____
- d. Forced Ductility _____
- e. Toughness & Tenacity _____
- f. Other _____

7. Does your State have now or expect to have within the next 3 years a Direct Tension Specification? _____ Yes* _____ No

- * **If Yes;** to better design for thermal cracking? _____ Yes _____ No
- to better identify use of modifier? _____ Yes _____ No
- to better distinguish modifier types? _____ Yes _____ No

8. Does your State use now or expect to use within the next 3 years AASHTO MPA Specification? _____ Yes* _____ No

* **If YES**, do you ... _____ Use Now _____ Expect to use

9. Would you be interested in and consider adopting a new test to any of the following:

- better predict compaction temperature? _____ Yes _____ No
- reduce rutting? _____ Yes _____ No
- reduce fatigue cracking? _____ Yes _____ No

10. Is the 2004 paving spending expected to be ___ up ___ down or ___ same from 2003?

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City: Carson City	State: NV Zip: 89712

1. Asphalt Binder Use

- How many liquid tons of **Binder** was let in 2003? 48,500 PG liquid tons
37,700 AC liquid tons
- How much of that was *MODIFIED BINDER*? 48,500 PG liquid tons
37,400 AC liquid tons
- Was this *more or less Modified* from 2002? More less
- Do you expect *more or less Modified* in 2004? X More* less
* If more, estimated increase in liquid tons? 10,000 liquid tons
- Do you expect to use *more or less Binder* in 2004? More less

2. Does your State **specify modifier and/or percentage of modifier** to be included in the binder? Yes X No

and/or

To meet a specified grade is modification required? X Yes No

3. Check all the Modifiers used in your State?

- a. SBS X
- b. SB X
- c. SBR X
- d. Latex *[[if known list type(s)]]*
- e. Other Polymer Modifier Type:
- f. Chemical Modifier Type:
- g. Other Modifier Type:

4. Does your State test for stability or separation? Yes* X No

* If Yes, which test(s) do you use?

5. What are the most common Modified Asphalt grades used in your State?

- a. PG64-28NV
- b. PG76-22NV
- c.

6. Does your State include, or plan to include, additional tests for PG Binder Specifications (*typically referred to as PG Plus or SHRP Plus*) to ensure Modifiers are used to improve asphalt binder performance? X Yes* No

* If YES...Check all that apply *(please describe specification)*

- a. DSR Phase Angle
- b. Direct Tension X
- c. Elastic Recovery
- d. Forced Ductility X
- e. Toughness & Tenacity X
- f. Other X Increase the Original DSR value for PG76-22NV

7. Does your State have now or expect to have within the next 3 years a Direct Tension Specification? X Yes* No

- * If Yes; to better design for thermal cracking? Yes No
- to better identify use of modifier? Yes No
- to better distinguish modifier types? Yes No

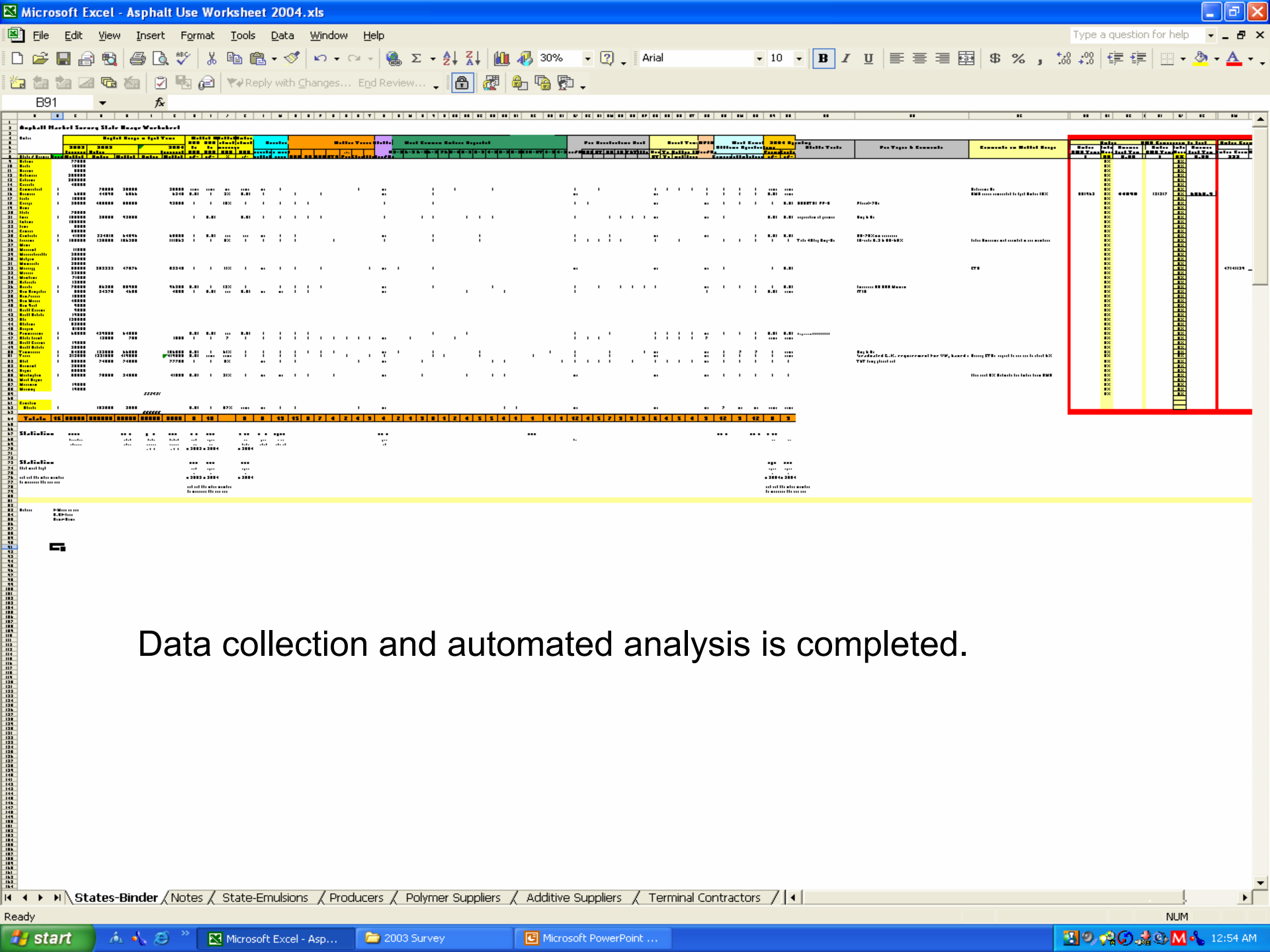
8. Does your State use now or expect to use within the next 3 years AASHTO MPA Specification? Yes* X No

* If YES; do you ... Use Now Expect to use

9. Would you be interested in and consider adopting a new test to any of the following:

- better predict compaction temperature? X Yes No
- reduce rutting? X Yes No
- reduce fatigue cracking? X Yes No

10. Is the 2004 paving spending expected to be X up down or same from 2003?



Data collection and automated analysis is completed.

2003 DOT in Review

Total Binders:

- 30% of Binder used was Modified
- 63% of responses used **More** in 2003 vs 2002
- 32% of responses used **Less** in 2003 vs 2002
- 70% of responses Expect to use **More** in 2004
- 21% of responses Expect to use **Less** in 2004

2003 DOT in Review

- 58% specify for Modification
- 74% must be Modified to Meet Spec.
- 26% have a Stability Specification
- 79% use *Plus* Specifications

Plus Specifications & the DOTs

- 79% have *Plus* Specifications
 - 40% are Dynamic Shear Rheometer
 - 33% are Direct Tension
 - 53% are Elastic Recovery
 - 20% are Forced Ductility
 - 27% are Toughness & Tenacity
 - 27% are Other (Ring & Ball; FTIR; etc)

Direct Tension vs. MP1A

- 42% of responses are using the DT
 - 75% to better predict Thermal Cracking
 - 88% to identify Modification
 - 63% to identify Modification Type
- 21% of responses are/intending to go MP1A
(M320 Table 2)

Would Consider Specifications

To Improve or Reduce:

- 84% Compaction
- 68% Rutting Resistance
- 84% Fatigue Cracking

2004 DOT Spending Expectation

- 63% Expect to Spend **More** on Paving
- 26% Expect to Spend **Less** on Paving

- 32% Expect to Spend **More** on Capital
- 32% Expect to Spend **Less** on Capital

Most Common Binders Reported

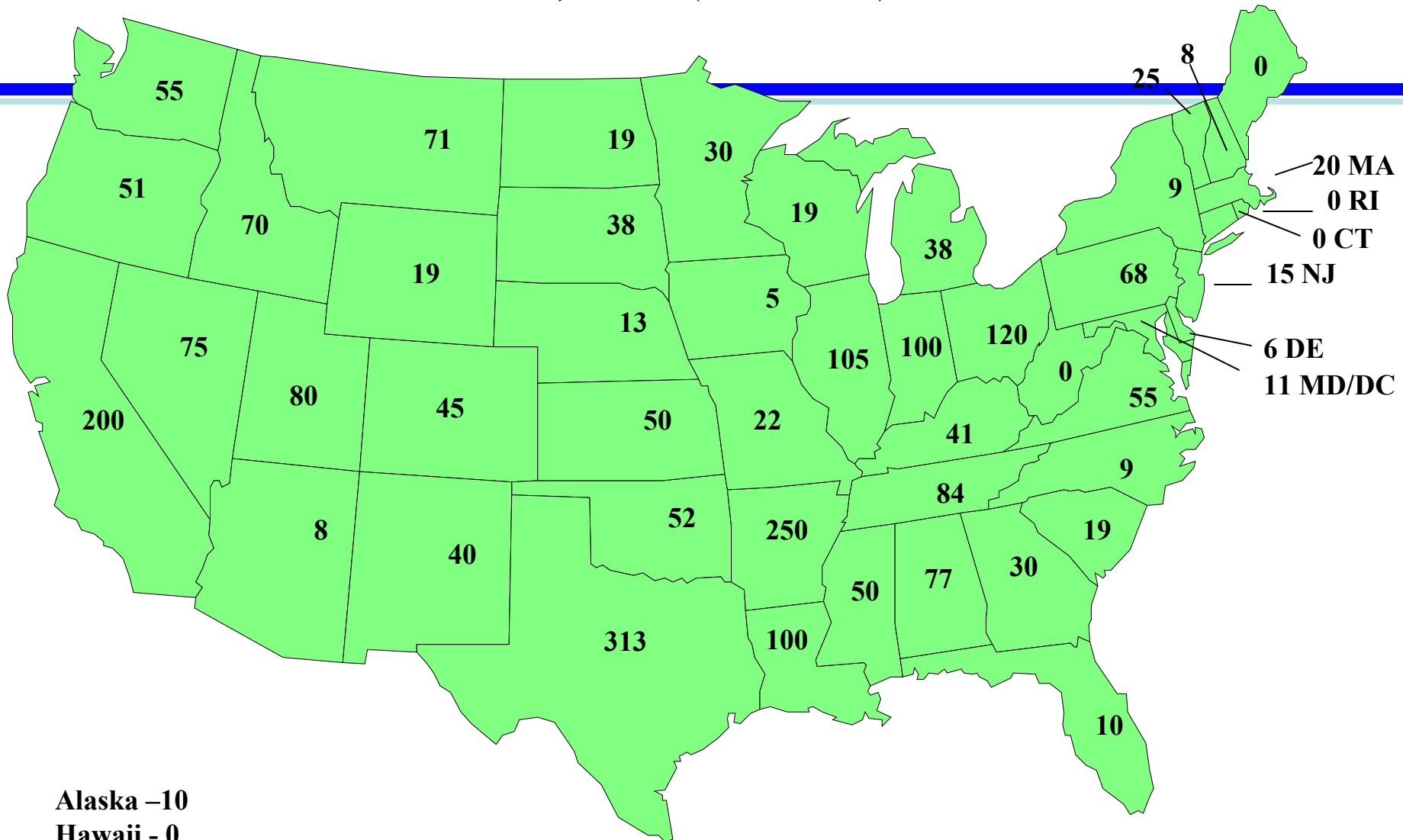
- 68% PG 76-22
- 26% PG 70-22
- 32% PG 64-28
- 21% PG 70-28
- 16% PG 58-34

Modifiers Used (of the respondents)

- 95% SBS Modified
- 63% SB Modified
- 63% SBR Latex Modified
- 11% Other Polymer Modified
- 21% Chemical Modified
- 19% Other (generally GTR; Oils)

Forecast Modified Asphalt Usage

2003, DOT(000 TONS)



Alaska -10
Hawaii - 0

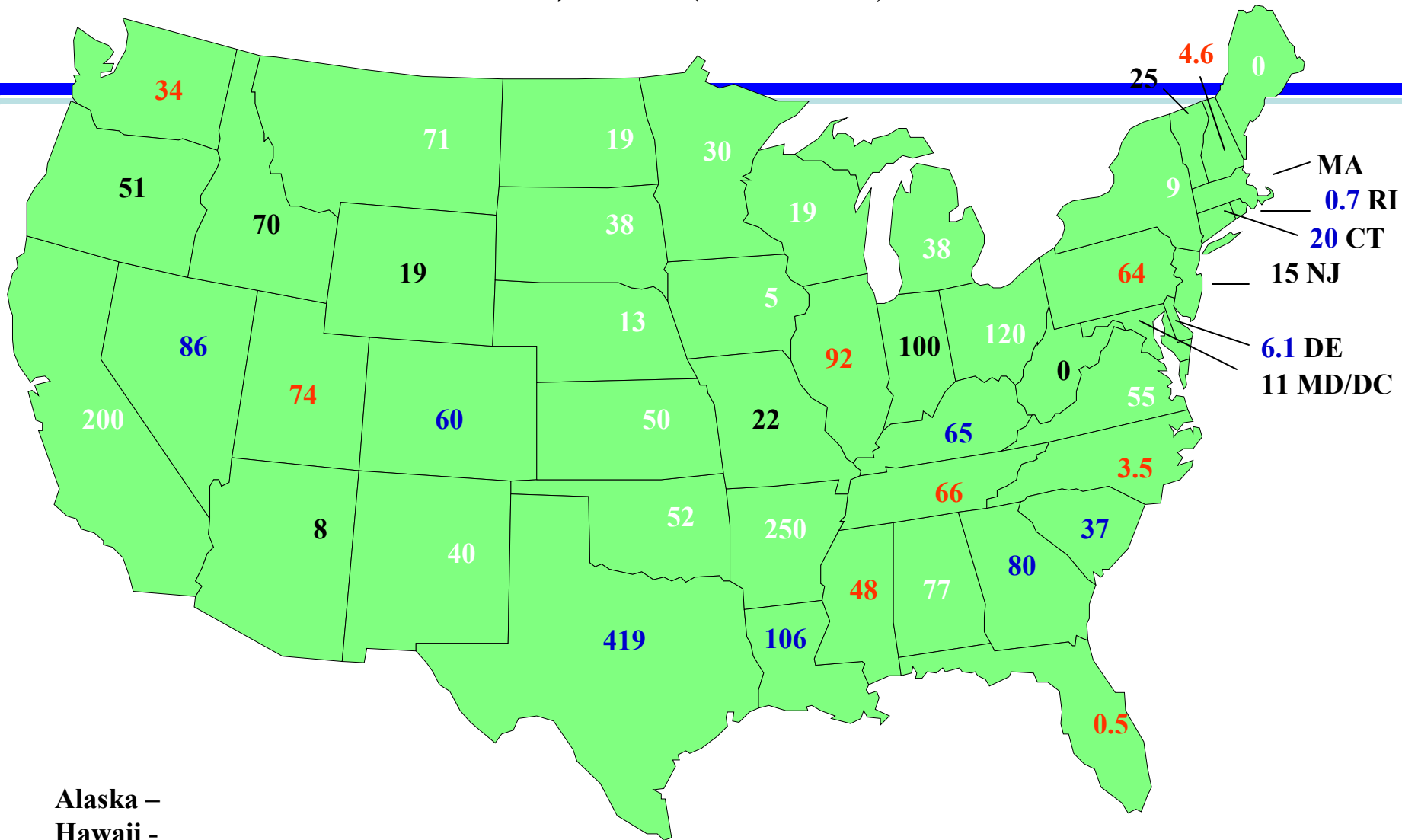
Total - 2,491

Key to the following charts

- **Blue** is an increase from previous
- **Red** is a decrease from previous
- **Black** denotes no change from previous
- **White** indicates incomplete information

Actual Modified Asphalt Usage

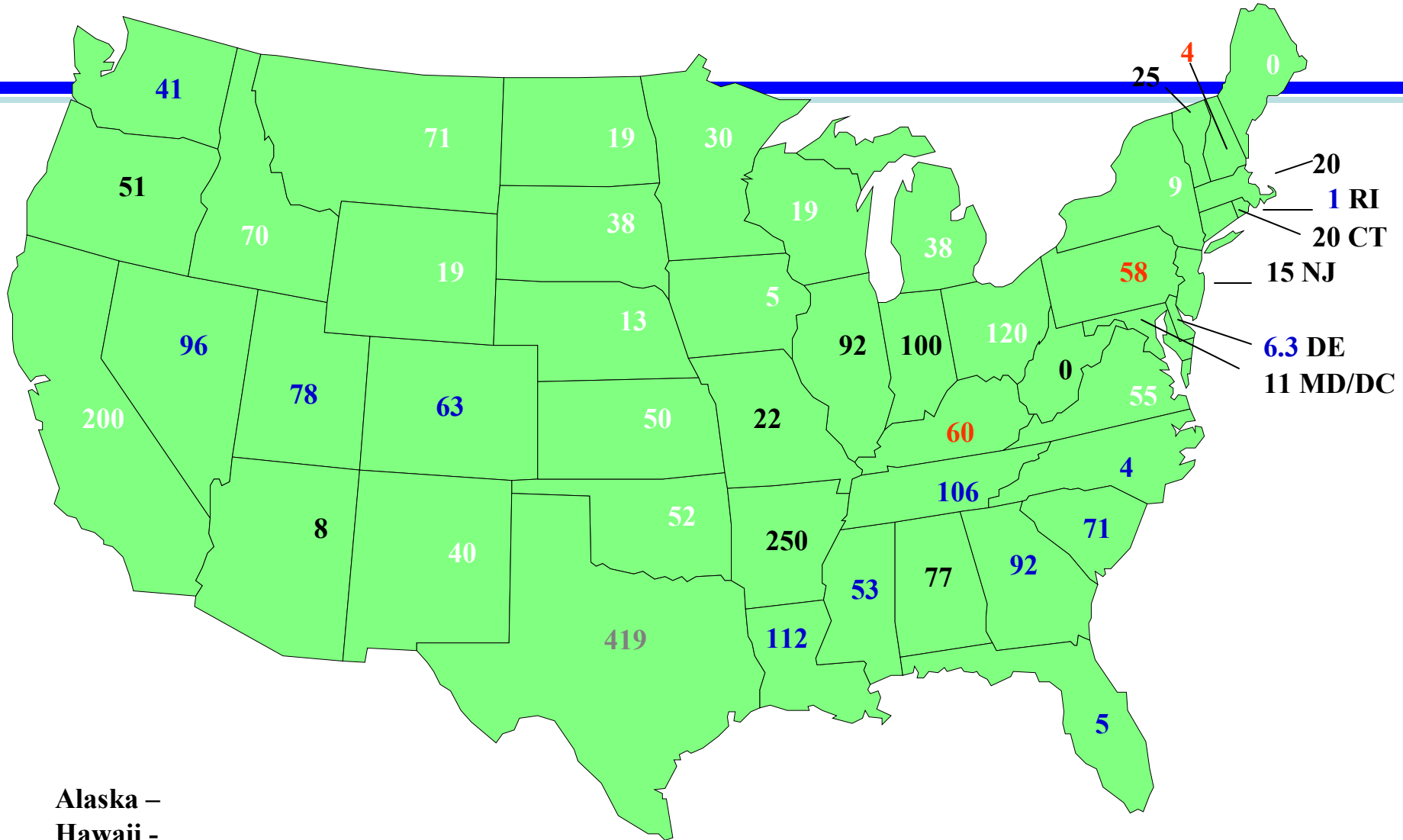
2003, DOT(000 TONS)



Alaska –
Hawaii –

Forecast Modified Asphalt Usage

2004, DOT(000 TONS)



Future Surveys

- More information is needed
 - Include the rest of the US DOTs & Canadian MOTs
 - Include Input from Producers & Suppliers
 - Account for Emulsions & non-paving use
- This Committee has recruited members to help to collect State data for 2005 Survey

Time to Join

- The results will be made available in a useable format for AMAP Members for analysis.
- www.modifiedasphalt.org