



Modified Asphalt Market Survey 2010 - 2011

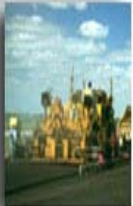
John Casola
Malvern Instruments

The Association of Modified Asphalt Producers Meeting

February 16-17, 2011



Modified Asphalt Survey



- Review DOT Survey & Results
- Actual Reported Usage in 2010
- Forecast 2011 Modified Usage
- State's Views on Modified Asphalt

2010 State DOT in Review

28 States participated in the Survey

- The States which did **NOT** respond are:

Arizona
Arkansas
California
Colorado
Delaware
Hawaii
Idaho
Indiana

Louisiana
Maine
Maryland
Massachusetts
New Jersey
New Mexico
North Carolina

North Dakota
Oregon
Rhode Island
Tennessee
Vermont
Virginia
West Virginia
Wisconsin

Italic States have responded in previous years

2010 State DOT in Review

The 28 which did Responded:

Alabama

Alaska

Connecticut

Florida

Georgia

Illinois

Iowa

Kansas

Kentucky

Pennsylvania

Michigan

Minnesota

Mississippi

Missouri

Montana

Nebraska

Nevada

New Hampshire

New York

Ohio

Oklahoma

South Carolina

South Dakota

Texas

Utah

Washington

Wyoming

The Survey

- The survey format has been consistent for the last 8 years.
- Enables Data Mining: U-WI has all the previous years on file for analysis

Who Replied by Region

- NCAUPG 75%
- SEAUPG 64%
- RMAUPG 60%
- NEAUPG 36%
- PCCAC 38%

Trends: % Modified of Total Binder

						Forecast
2005	2006	2007	2008	2009	2010	2011
25%	24%	24%	25%	26%	32%	29%

Modifiers Used (of the respondents)

2011

- 93% SBS Modified
- 50% SB Modified
- 46% SBR Latex Modified
- 19% Other Polymer Modified (EVA, etc)
- 26% PPA
- 33% Crumb Rubber Modified (CRM/GTR)
- 7% Chemical Modified (oils, etc)
- 4% Other Chemical (Air Blown)

Modifiers Used (of the respondents)

2010

- 91% SBS Modified
- 52% SB Modified
- 61% SBR Latex Modified
- 43% Other Polymer Modified (EVA, etc)
- 17% PPA
- 39% Crumb Rubber Modified (CRM/GTR)
- 4% Chemical Modified (oils, etc)
- 4% Other Chemical (Air Blown)

Most Common Binders Reported

2010

- | | |
|----------------|-------------------|
| • 68% PG 64-22 | 41% are Modified |
| • 56% PG 76-22 | 100% are Modified |
| • 46% PG 64-28 | 100% are Modified |
| • 43% PG 58-28 | 59% are Modified |
| • 29% PG 70-22 | 100% are Modified |
| • 25% PG 70-28 | 100% are Modified |
| • 15% PG 58-22 | 89% are Modified |
| • 15% PG 76-28 | 100% are Modified |
| • 15% PG 67-22 | 85% are Modified |
| • 19% PG 58-34 | 100% are Modified |

Most Common Binders Reported

2009

- | | |
|----------------|-------------------|
| • 69% PG 64-22 | 35% are Modified |
| • 55% PG 76-22 | 100% are Modified |
| • 50% PG 64-28 | 95% are Modified |
| • 46% PG 58-28 | 64% are Modified |
| • 36% PG 70-22 | 95% are Modified |
| • 23% PG 70-28 | 77% are Modified |
| • 18% PG 58-22 | 86% are Modified |
| • 18% PG 76-28 | 100% are Modified |
| • 14% PG 67-22 | 86% are Modified |
| • 9% PG 58-34 | 100% are Modified |

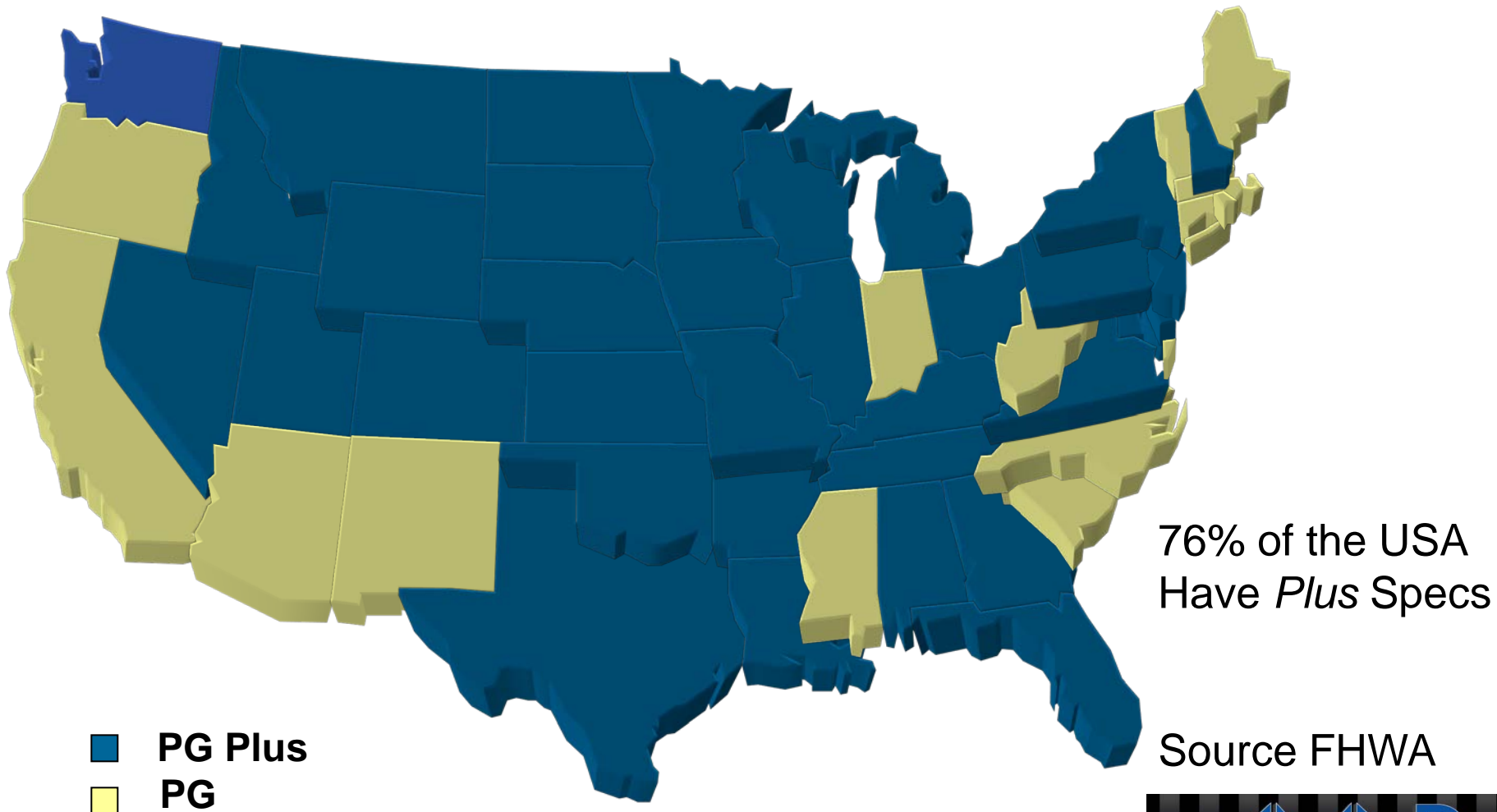
2010 DOT in Review

- 75% must be Modified to Meet Specification
- 50% specify for Modification
- 47% Specify Type of Modifier
- 22% Specify Percent of Modifier
- 43% have a Stability Specification

Modes Of Failure Addressed with Modified Binder

- 82% Rutting
- 64% Fatigue Cracking
- 57% Thermal Cracking
- 11% Other (raveling / stripping)

State DOT's with *Plus* Spec's



2010 DOT in Review

Plus Specifications:

- 42% responded have *Plus* Specs out of All 50 States

Responses:

- 75% of those responded have *Plus* Specs

Plus Specifications & the DOTs

- Of the 75% that have *Plus* Specifications
 - 76% are Elastic Recovery
 - 52% are DSR; Multiple Stress Creep Recovery
 - 38% are DSR; Phase
 - 33% are Other (Ring & Ball; FTIR; etc)
 - 20% are Toughness & Tenacity
 - 15% are Forced Ductility
 - 10% are Direct Tension

Would Consider Specifications...

Additional Spec's To Improve or Reduce:

- **64% Compaction for HMA**
 - **50% Rutting Resistance of HMA**
 - **75% Fatigue Cracking for HMA**
-
- **68% Chip Retention of Emulsions**
 - **68% for an Emulsion Performance Spec**

Experiences with Modified Asphalt

- **Very Satisfied** 43%
- **Satisfied** 36%
- **Neutral** 7%
- **Unsatisfied** 0%
- No Comment** 15%

79% are Satisfied

Experiences with Modified Construction

- **Very Satisfied** 32%
- **Satisfied** 50%
- **Neutral** 4%
- **Unsatisfied** 0%
- No Comment** 15%

82% are Satisfied

2011 DOT Spending Expectation

- 11% Expect to Spend **More** on Paving
- 25% Expect to Spend the **Same** on Paving
- 54% Expect to Spend **Less** on Paving

2010 DOT in Review

Total Binders Reported: **6,629,362** liquid tons

- 12 % of responses Expect to use **More** in 2011
- 82% of responses Expect to use **Less** in 2011
- 6 % of responses Expect to use **Same** in 2011

2010 DOT in Review

Total Modified reported:

Reported: **1,895,487** liquid tons

- **29%** of Binder reported was Modified

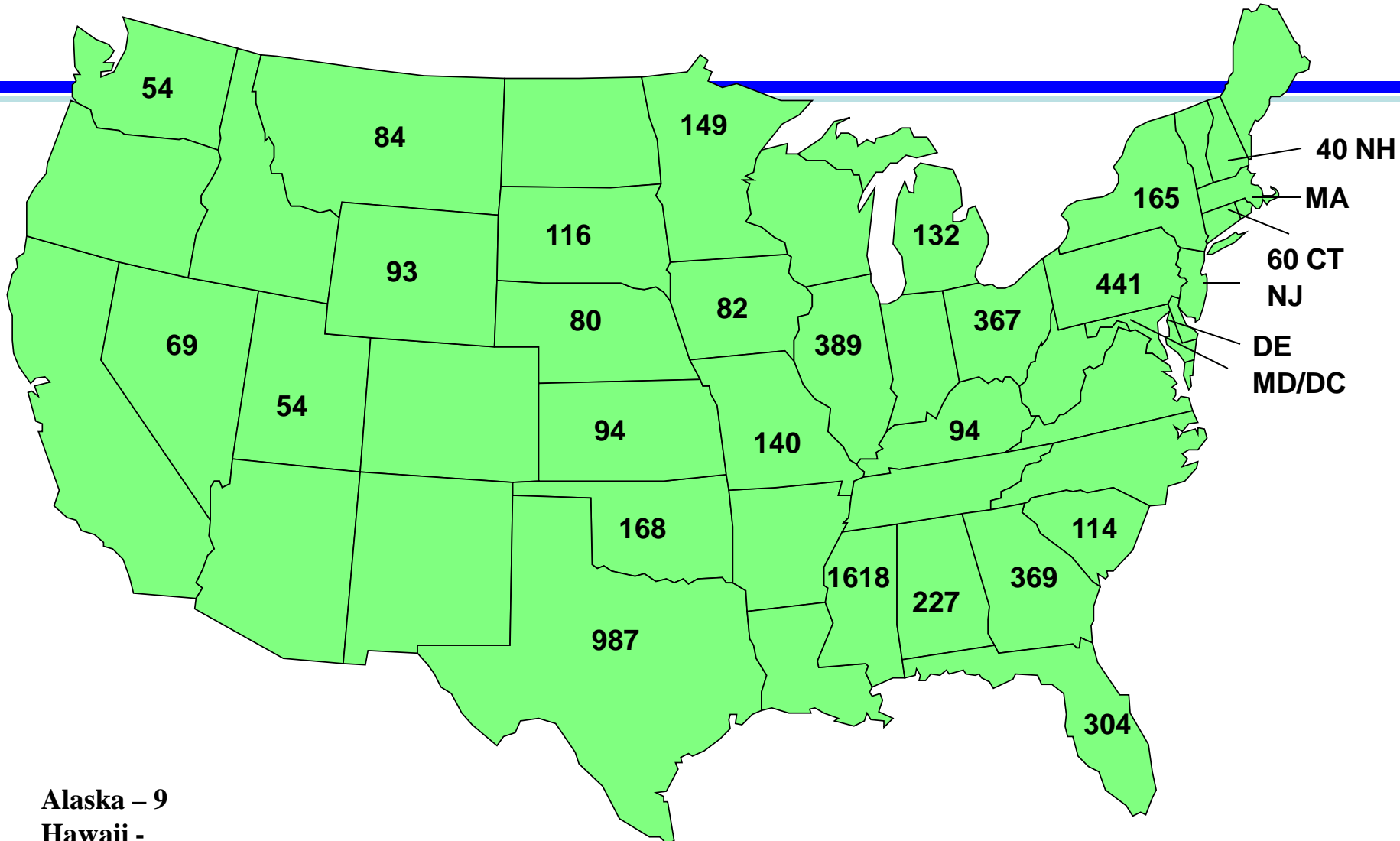
2010 DOT in Review

Total Modified Reported: **1,895,487** liquid tons

- 47% of responses used **More** in 2010 vs 2009
- 36% of responses used **Less** in 2010 vs 2009
- 12% of responses Expect to use **More** in 2011
- 82% of responses Expect to use **Less** in 2011

Total Asphalt Useage

2010, DOT(000 TONS)



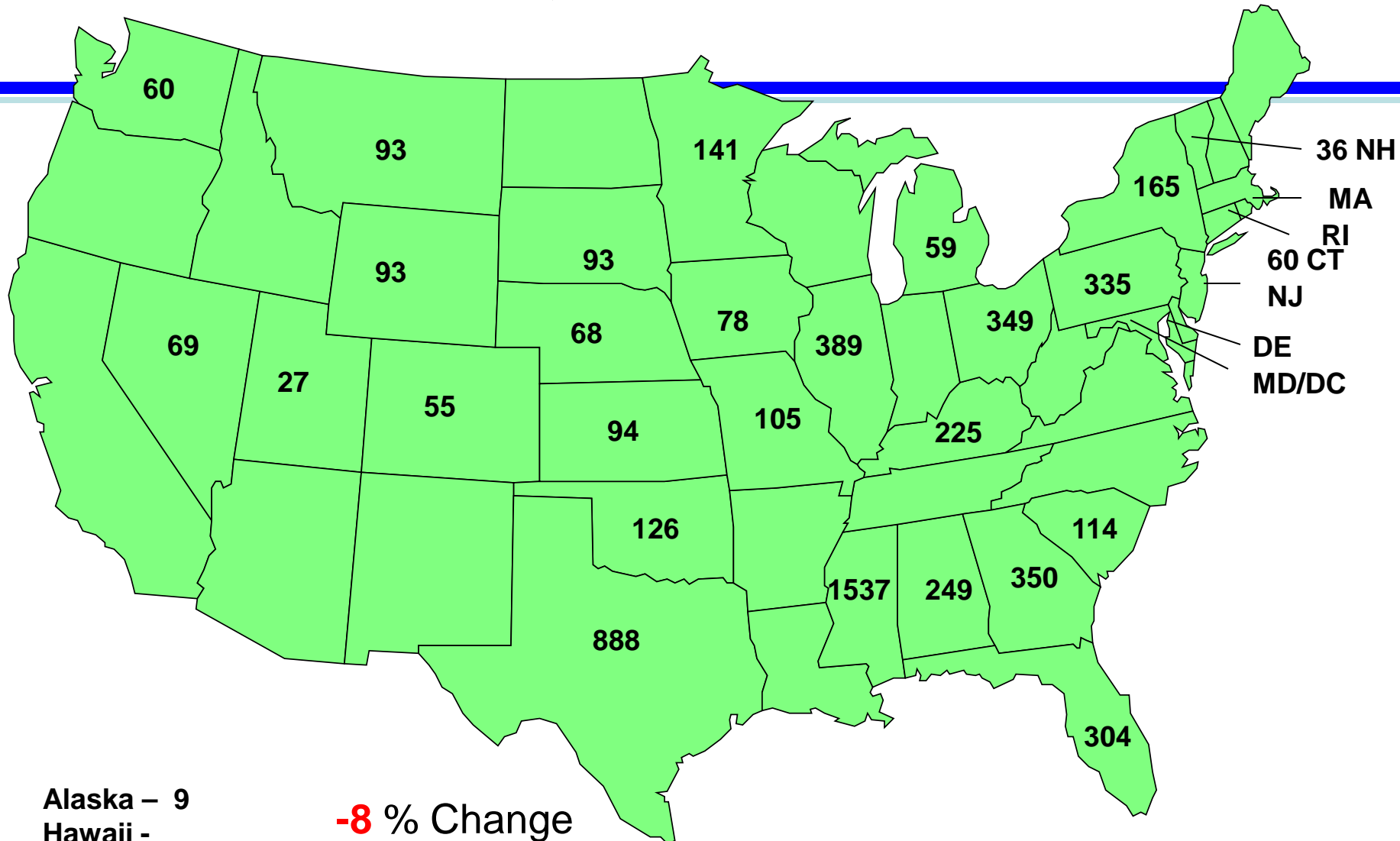
Alaska – 9

Hawaii -

Total 6,629,362

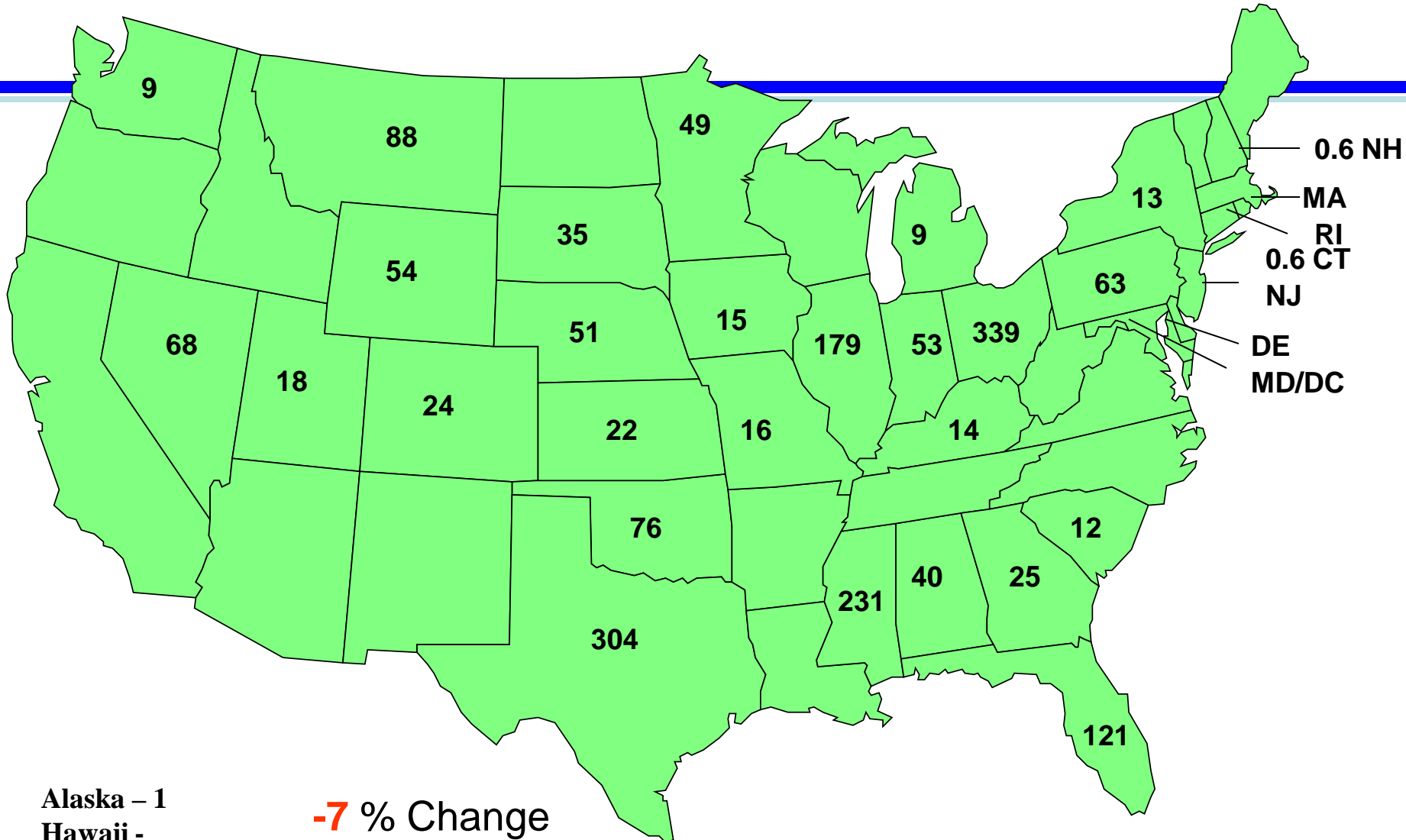
Asphalt Forecast

2011, DOT(000 TONS)



Modified Asphalt Forecast

2011, DOT(000 TONS)



-7 % Change

Total 1,75,608

This Survey...

- will be updated as additional information is received.
- will be located on the AMAP website

www.modifiedasphalt.org



Questions?

www.modifiedasphalt.org





Many thanks

- To all the participating States DOTs for their responses
- To all the members that helped collect all the information

www.modifiedasphalt.org





Who is AMAP?

A not-for-profit organization comprised of a diverse collection of industry leaders involved in all aspects of the modified asphalt market.

Asphalt suppliers, modified asphalt producers, additives suppliers, contractors, lab equipment & testing services, consultants, even some DOT Engineers comprise the AMAP membership.

www.modifiedasphalt.org





What is our mission?

An association committed to informing owners, contractors and all specifying agencies of the performance and economic benefits of modified asphalt binders for bituminous pavements

www.modifiedasphalt.org





AMAP Provides Industry Solutions

Information: Modified Asphalt technology Clearinghouse.

Support: Industry experts are available to answer questions.

Education: Provide training courses, workshops and seminars specific to Modified Asphalt..

www.modifiedasphalt.org

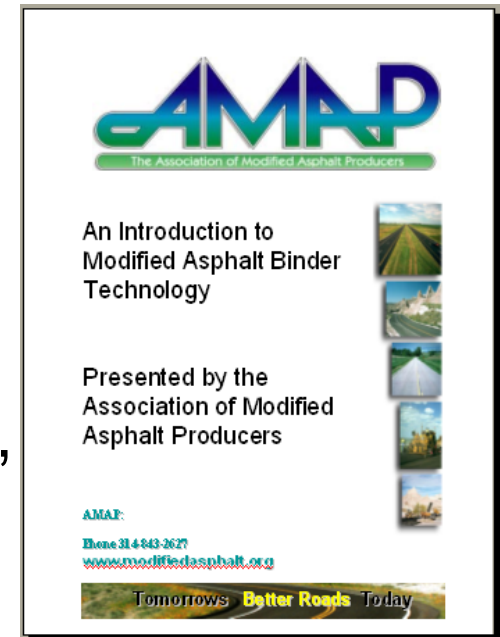




Workshops:

An Introduction to Modified Asphalt Binder Technology

Covers all the basics from chemistry, asphalt rheology, testing, specifications, handling, and background to life cycle cost analysis.



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