RAP, RAS & WMA Survey

John Bukowski

FHWA

Office of Pavement Technology
The Survey

Who
- US Asphalt Producers

How
- Online survey
- Email
- Phone
General Information Questions

Number of Plants

HMA/WMA Tons
- DOT
- Other Agency
- Commercial and Residential
RAP & RAS Questions

**Tons**
- HMA/WMA
- Aggregate
- Cold Mix
- Other
- Landfill

**Percentages**
- DOT
- Other Agency
- Commercial & Residential
WMA Questions

- Percent
  - DOT
  - Other Agency
  - Commercial & Residential

- Technology
  - Chemical
  - Additive Foaming
  - Plant Foaming
  - Organic
How did we do?

- 48 States/Provinces
  - Not reporting
  - District of Columbia
  - New Mexico
  - North Dakota
  - Nebraska

- 196 Companies/Branches

- 1,027 Plants
## Companies Reporting per State

<table>
<thead>
<tr>
<th>Number of Companies/Branches Completing Survey in State</th>
<th>Number of States</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>≥ 5</td>
<td>17</td>
</tr>
</tbody>
</table>
Reported Asphalt Tons

- 2009
- 2010

- Commercial & Residential
- Other Agency
- DOT

Millions
Given total tons

- 28 SAPAs provided estimated tons
  - about non-reported 240 million tons
- Developed relationships
  - Tons vs. Population
  - Tons vs. Fed. Apportionment
  - Tons vs. Miles Paved.
How many total tons?

2009 Estimated Tonnage Variation from Given Value for All SAPA State Reporting

- Population
- Apportionment
- Miles Paved
How many total tons?

2010 Estimated Tonnage Variation from Given Value for All SAPA States Reporting

<table>
<thead>
<tr>
<th>% Variation from Given Tonnage</th>
<th>No. Less Than % Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>Population, Apportionment, Miles Paved</td>
</tr>
<tr>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>80%</td>
<td></td>
</tr>
<tr>
<td>90%</td>
<td></td>
</tr>
<tr>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>
Estimated Total RAP

- **2009**
  - Tons Accepted: 67.2
  - Tons use in HMA/WMA: 56.0
  - Tons used in Aggregate: 6.2
  - Tons used in Cold Mix: 1.5
  - Tons used in Other: 0.7
  - Tons Landfilled: 0.1

- **2010**
  - Tons Accepted: 72.9
  - Tons use in HMA/WMA: 61.6
  - Tons used in Aggregate: 7.3
  - Tons used in Cold Mix: 1.6
  - Tons used in Other: 0.8
  - Tons Landfilled: 0.0
RAP

<table>
<thead>
<tr>
<th>Year</th>
<th>Avg % for DOT mixes</th>
<th>Avg % for Other Agency mixes</th>
<th>Avg % for Commercial &amp; Residential</th>
<th>National average all mixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>12.5%</td>
<td>14.0%</td>
<td>15.6%</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>13.2%</td>
<td>15.2%</td>
<td>18.0%</td>
<td>17.2%</td>
</tr>
</tbody>
</table>
RAS

Companies/Branches Using

- 2009 – 44
- 2010 – 61
Estimated Total RAS

- Tons Accepted: 957
- Tons use in HMA/WMA: 702
- Tons used in Aggregate: 6
- Tons used in Cold Mix: 0
- Tons used in Other: 123
- Tons Landfilled: 0

2009:
- Thousands: 957

2010:
- Thousands: 1,851
  - Tons Landfilled: 1,100
Reported WMA

- Avg. % of DOT tons
- Avg % of Other Agency tons
- Avg % of Commercial & Residential tons
Reported WMA

- Chemical Additive %
- Additive Foaming %
- Plant Foaming %
- Organic Additive %
## Total Estimated Tonnages

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMA/WMA Tons</td>
<td>358 MT</td>
<td>358 MT</td>
</tr>
<tr>
<td>RAP used in HMA/WMA</td>
<td>56 MT</td>
<td>62 MT</td>
</tr>
<tr>
<td>Total RAP Recycled</td>
<td>64 MT</td>
<td>71 MT</td>
</tr>
<tr>
<td>Total RAS in HMA/WMA</td>
<td>0.72 MT</td>
<td>1.14 MT</td>
</tr>
<tr>
<td>Total WMA Tons</td>
<td>16.7 MT</td>
<td>47.2 MT</td>
</tr>
</tbody>
</table>
Summary

- RAP use growing steadily
  - 10% increase 2009-2010
- RAS use growing rapidly
  - 57% increase 2009-2010
- RAP & RAS saving over 4 MT binder
- WMA growing very rapidly
  - 180% increase 2009-2010
### Summary

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMA/WMA Tons</td>
<td>358 MT</td>
<td>358 MT</td>
</tr>
<tr>
<td>RAP used in HMA/WMA</td>
<td>15.6%</td>
<td>17.2%</td>
</tr>
<tr>
<td>Total RAP Recycled</td>
<td>17.9%</td>
<td>19.8%</td>
</tr>
<tr>
<td>Total RAS in HMA/WMA</td>
<td>0.2%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Total WMA Tons</td>
<td>4.7%</td>
<td>13.2%</td>
</tr>
</tbody>
</table>