State of the Industry

Howie Moseley
State Bituminous Materials Engineer
State Highway System

- 43,920 lane miles of roadway
  - 8,242 interstate lane miles
  - 33,465 arterial lane miles
  - 2,213 turnpike lane miles
- 42,858 lane miles are asphalt (97.6%)
- 1,062 lane miles are PCC (2.4%)
## Asphalt Producers for Florida

<table>
<thead>
<tr>
<th></th>
<th>In-State</th>
<th>Out-of-State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Plants</td>
<td>93</td>
<td>2</td>
</tr>
<tr>
<td>Asphalt Contractors</td>
<td>43</td>
<td>2</td>
</tr>
<tr>
<td>Asphalt Binder Terminals</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Asphalt Rubber Terminals</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>GTR Suppliers</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
## FDOT Asphalt Tonnage (FY 16/17)

<table>
<thead>
<tr>
<th>Friction</th>
<th>Structural</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC-5</td>
<td>SP 19.0</td>
<td>486,125</td>
</tr>
<tr>
<td>FC-12.5</td>
<td>SP 12.5</td>
<td>575,441</td>
</tr>
<tr>
<td>FC-9.5</td>
<td>SP 9.5</td>
<td>292,743</td>
</tr>
<tr>
<td>FC-4.75</td>
<td>SP 4.75</td>
<td>12,986</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65,493</td>
<td>3,089,971</td>
<td>4,666,553</td>
</tr>
</tbody>
</table>
| 141,778  | 2,016      | 3.30 million tons of structural course and base.
| 4,666,553|            | 1.37 million tons of friction course.

- 15.5 million tons of asphalt mix produced in Florida in 2016 (public and private work).
Historical FDOT Asphalt Tonnage
Asphalt Tonnage By District (FY 16/17)
Asphalt Tonnage By Producer (FY 16/17)

Asphalt Production > 100,000 Tons
Binder Tonnage (FY 16/17)
RAP Usage

- 625,000 Tons of RAP
- 35,000 Tons of Binder from RAP
- 590,000 Tons of Aggregate from RAP
<table>
<thead>
<tr>
<th>Condition</th>
<th>FY 10/11</th>
<th>FY 11/12</th>
<th>FY 12/13</th>
<th>FY 13/14</th>
<th>FY 14/15</th>
<th>FY 15/16</th>
<th>FY 16/17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unrestricted (No max limit)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>25%</td>
<td>26%</td>
<td>25%</td>
<td>29%</td>
<td>24%</td>
<td>29%</td>
<td>27%</td>
</tr>
<tr>
<td>Maximum</td>
<td>40%</td>
<td>38%</td>
<td>39%</td>
<td>45%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FDOT restricted (Max 20%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>17%</td>
<td>18%</td>
<td>16%</td>
<td>19%</td>
<td>20%</td>
<td>20%</td>
<td>19%</td>
</tr>
<tr>
<td>Maximum</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
<td>20%</td>
</tr>
</tbody>
</table>
Costs
Asphalt Mix Cost
Asphalt Binder Cost
Composite Pay Factor (CPF) Data

- Statewide Average CPF
  - FY 16/17: 1.013
  - FY 15/16: 1.009
  - FY 14/15: 1.018
  - FY 13/14: 1.019
  - FY 12/13: 1.011
  - FY 11/12: 1.015
## Composite Pay Factor (CPF) Data

### Dense Graded Pay Factor Data

<table>
<thead>
<tr>
<th>Density</th>
<th>AC</th>
<th>Air Voids</th>
<th>#8 Sieve</th>
<th>#200 Sieve</th>
<th>CPF</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.992</td>
<td>1.031</td>
<td>1.024</td>
<td>0.997</td>
<td>1.025</td>
<td>1.013</td>
</tr>
</tbody>
</table>

### Open Graded Pay Factor Data

<table>
<thead>
<tr>
<th>AC</th>
<th>3/8” Sieve</th>
<th>#4 Sieve</th>
<th>#8 Sieve</th>
<th>CPF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.011</td>
<td>1.012</td>
<td>1.015</td>
<td>1.018</td>
<td>1.014</td>
</tr>
</tbody>
</table>
Top Producer CPF (>100,000 tons)

- FY 16/17: DAB (1.033)
- FY 15/16: DAB (1.019)
- FY 14/15: Atlantic Coast Asphalt (1.032)
- FY 13/14: DAB (1.037)
- FY 12/13: DAB (1.040)
- FY 11/12: APAC (1.037)
Top Producer CPF (25,000 to 100,000 tons)

- FY 16/17: Superior Asphalt (1.042)
- FY 15/16: Whitehurst (1.036)
- FY 14/15: Roads Inc. (1.042)
- FY 13/14: JW Cheatham (1.046)
- FY 12/13: Asphalt Group (1.037)
- FY 11/12: Peavy & Sons (1.037)
Smoothness Data
# 2011-2017 Laser Acceptance Projects

<table>
<thead>
<tr>
<th>Year</th>
<th>Average IRI (inch/mile)*</th>
<th>No MTV Used</th>
<th>MTV Used</th>
<th>No. Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td></td>
<td>55</td>
<td>48</td>
<td>59</td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td>59</td>
<td>50</td>
<td>74</td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td>55</td>
<td>44</td>
<td>77</td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td>65</td>
<td>47</td>
<td>52</td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td>62</td>
<td>46</td>
<td>86</td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td>58</td>
<td>49</td>
<td>94</td>
</tr>
<tr>
<td>2017</td>
<td></td>
<td>-</td>
<td>48</td>
<td>43</td>
</tr>
<tr>
<td>2011 - 2017</td>
<td></td>
<td>59</td>
<td>47</td>
<td>485</td>
</tr>
</tbody>
</table>

* Weighted per project
Pavement Performance
## Statewide Pavement Performance

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>16.5</td>
<td>16.5</td>
<td>14.4</td>
<td>12.4</td>
<td>11.1</td>
<td>9.4</td>
<td>8.4</td>
<td>7.3</td>
<td>7.7</td>
<td>8.5</td>
<td>8.2</td>
</tr>
<tr>
<td>Ride</td>
<td>3.5</td>
<td>3.2</td>
<td>2.6</td>
<td>2.6</td>
<td>2.6</td>
<td>1.9</td>
<td>2.1</td>
<td>1.7</td>
<td>2.0</td>
<td>1.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Crack</td>
<td>14.6</td>
<td>14.9</td>
<td>13.0</td>
<td>10.9</td>
<td>9.7</td>
<td>7.9</td>
<td>6.8</td>
<td>6.0</td>
<td>6.4</td>
<td>7.3</td>
<td>7.1</td>
</tr>
<tr>
<td>Rut</td>
<td>0.9</td>
<td>1.0</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.5</td>
<td>0.5</td>
<td>0.4</td>
<td>0.4</td>
<td>0.3</td>
<td>0.2</td>
</tr>
</tbody>
</table>

The table above shows the deficient pavements (%) for various criteria from 2007 to 2017.
District 1 Historical Performance

% of SHS Deficient

PCS Year

- Crack
- Ride
- Rut

Florida Department of Transportation
District 3 Historical Performance

% of SHS Deficient

PCS Year


Crack
Ride
Rut

Florida Department of Transportation
Turnpike Historical Performance

% of SHS Deficient

PCS Year


PCY

Crack
Ride
Rut

Florida Department of Transportation
Statewide Pavement Performance

Percent of State Highway System Meeting Standards

Florida Department of Transportation
Resurfacing Program

• Statutory Requirement
  – Ensure 80% of pavement on the State Highway System meets Department standards.

• Internal Objective
  – Ensure 90% of interstates and the turnpike meet Department standards.

• Resurface enough lane miles annually to maintain these two requirements.
Florida Department of Transportation

Work Program

Florida Department of Transportation
Total Funding by Source
FY 2018 - 2022

Total 5-Year Adopted Work Program $48,939M
FLORIDA DEPARTMENT OF TRANSPORTATION WORK PROGRAM
TOTAL CONSTRUCTION
FY 2018 - 2022

Five Year Summary

- Capacity Improvement: 16,508.5, 72%
- Safety: 644.1, 3%
- Bridge: 2,163.9, 9%
- Resurfacing: 3,645.9, 16%

Annual Program Levels

- 2018: $5,535.0
- 2019: $4,520.0
- 2020: $4,350.4
- 2021: $4,148.8
- 2022: $4,408.0

Total 5-Year Adopted Work Program $22,962M
Asphalt Stuff You Don’t See Everyday
Bridge Resurfacing

- Dames Point Bridge in Jacksonville
Windrow Paving
High Polymer Project in Midway

- Performing well with no significant rutting.
- Rutting was in excess of 2.5”.
The Balmoral Group Survey

- Strategic Resource Evaluation Study
- Survey was emailed on 11/8/17
  - It will be resent today
  - Sent to the plant contact listed in MAC
- Results are only reported in the aggregate
- Please take the time to send it in
- Results are provided upon request
Hot Item Update

• FC-5 Usage
  – No longer in curb and gutter areas
  – Not required on ramps
• Silica Rule / Pavement Bond
• Segregation
• High Polymer Binder Usage
  – Additional guidance provided
  – Coordinated with SMO
Recent Specification Changes
• Section 334 – Superpave Asphalt Concrete.
  – Mix design traffic levels have been consolidated to three levels; A’s and B’s are the same and D’s and E’s are the same.
  – Substitutions one level higher still allowed, if the contractor desires.
Section 916 – Bituminous Materials.

- PG 76-22 (PMA) and PG 76-22 (ARB) are considered equivalents and will be the contractor’s choice.

- For projects let prior to January 2017, contractor can switch if desired. Provide $4.50/ton credit to the Department.

- The use of waste oil (not REOBs) is prohibited in the modification of any PG binder grade.
• Section 234 – Superpave Asphalt Base
  – The Contractor may use a Type SP-12.5 mixture (Traffic Level B, C, D, or E), in lieu of a Type B-12.5.
• High Polymer binder replaces PG 82-22 (PMA).
January 2018 Workbook

- Section 334 – Superpave Asphalt Concrete.
  - Definition of warm mix added:
    - For unmodified mixtures: Mixing temperature ≤ 285 °F.
    - For modified mixtures: Mixing temperature ≤ 305 °F.
  - Change in length for non-density areas from 1000’ to 500’.
    - “Density testing for acceptance will not be performed on the following areas when they are less than 500 feet (continuous) in length: turning lanes, acceleration lanes, deceleration lanes, shoulders, parallel parking lanes or ramps.”
Section 334 – Superpave Asphalt Concrete.

The following clarification added:

“Do not perform density testing for acceptance in a sublot if the plant random sample for that sublot has not been obtained.”
Active Contracted Research Projects

- Impact of Recycled Asphalt Shingles (RAS) on Asphalt Binder Performance
- Evaluation of Reflective Cracking Mitigation Treatments Using the CSIC Test
- High Reclaimed Asphalt Pavement (RAP) Asphalt Mixes for Low Volume Roads
- Best Practices for Construction and Repair of Bridge Approaches and Departures
- Evaluation of FC-5 with High Polymer Binder to Reduce Raveling
Active Contracted Research Projects

- Determine the Structural Coefficient for Asphalt Mixes Containing High Polymer Binder
- Enhanced Characterization of RAP for Cracking Performance
- Evaluation of Roadway Worms/Distortions
- Study of the Potential Benefits of Anti-Strip Additives on Granite Based FC-5 Asphalt Mixtures
Active Contracted Research Projects

- Development of a Procedure for Evaluating and Approving Liquid Anti-Strip Agents
- Evaluation of the Cracking Performance of Asphalt Binders at Intermediate Temperatures
My Contact Information

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