Major Issues in the World of Asphalt in Florida

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Florida Department of Transportation
Major Issues:

1. Increasing construction costs
2. Materials shortages
3. FDOT response to 1 & 2
4. Pavement Stuff
Florida

- Population: Over 15.9 million
  - 4th Largest State in the US
  - Increases by 1,200 people per day
- Roadways: 114,000 miles
- State Highway System
  - 12,000 miles of roadway
    - 44,000 lane miles
  - Carries 66% of all traffic in state
Florida

- Florida Department of Transportation
  - $3 billion construction budget
    - Approximately 500 Construction contracts/year
  - Approximately 5.2 million tons hot mix asphalt (HMA) placed per year
    - Total amount of HMA statewide = 19 million tons
Asphalt in Florida

• 100% Superpave since 1998
  – Follow AASHTO requirements
  – 9.5, 12.5 & 19.0 mm NMAS

• Open-Graded Friction Courses
  – High speed, multi-lane roadways

• Construction acceptance:
  – Percent Within Limits (PWL)
  – Based on Verified Contractor data
Major Issue No. 1:  
Cost Increases
## Construction Price Increases

<table>
<thead>
<tr>
<th>Pay Item Group</th>
<th>Unit</th>
<th>2003</th>
<th>2004</th>
<th>Change</th>
<th>2005</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthwork</td>
<td>CY</td>
<td>$4.96</td>
<td>$4.38</td>
<td>-11.7%</td>
<td>$7.24</td>
<td>+65.3%</td>
</tr>
<tr>
<td>Asphalt</td>
<td>TN</td>
<td>$55.93</td>
<td>$61.63</td>
<td>+14.3%</td>
<td>$75.81</td>
<td>+21.9%</td>
</tr>
<tr>
<td>Concrete (Structural)</td>
<td>CY</td>
<td>$550.56</td>
<td>$564.12</td>
<td>+2.5%</td>
<td>$749.87</td>
<td>+32.8%</td>
</tr>
<tr>
<td>Steel (Structural)</td>
<td>LB</td>
<td>$1.06</td>
<td>$1.48</td>
<td>+39.6%</td>
<td>$1.57</td>
<td>+6.1%</td>
</tr>
<tr>
<td>Steel (Reinforcing)</td>
<td>LB</td>
<td>$0.52</td>
<td>$0.75</td>
<td>+44.2%</td>
<td>$0.89</td>
<td>+18.7%</td>
</tr>
</tbody>
</table>
Causes for Major Cost Increases

- Construction market saturation
  - “Hot” Market, both public and private sector
  - Additional work recovering from 8 hurricanes
  - Labor shortages
  - Material shortages
- Fuel cost increases
Causes for Major Cost Increases

- Materials price increases (earthwork, asphalt, concrete, steel)
- Trucking cost increases
- Project requirements:
  - Hours of operation
  - Night work
- Not enough bidding competition
## Contract Lettings

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Number of Contracts</th>
<th>Avg Number of Bidders Per Contract</th>
<th>Contracts With No Bid</th>
<th>Contracts with One Bid</th>
<th>Contracts with Two Bids</th>
<th>Percent of Contracts w/0, 1, or 2 Bids</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002/03</td>
<td>243</td>
<td>4.3</td>
<td>0</td>
<td>7</td>
<td>27</td>
<td>14%</td>
</tr>
<tr>
<td>2003/04</td>
<td>238</td>
<td>3.9</td>
<td>0</td>
<td>20</td>
<td>43</td>
<td>27%</td>
</tr>
<tr>
<td>2004/05</td>
<td>240</td>
<td>3.5</td>
<td>4</td>
<td>11</td>
<td>51</td>
<td>28%</td>
</tr>
<tr>
<td>2005/06*</td>
<td>96</td>
<td>2.9</td>
<td>1</td>
<td>6</td>
<td>32</td>
<td>41%</td>
</tr>
</tbody>
</table>

* Data through November 2005 Letting
Asphalt Related Costs

Current costs of aggregate, binder and hot mix asphalt are at an all time high!

- Binder: 1.44 $/gal (330 $/ton)
- Aggregate: 18 – 23 $/ton
- HMA: 81 $/ton
Rising Cost of HMA in Florida

Year

$/Ton

HMA Costs 2005/2006

![Bar chart showing HMA costs for May to February 2005/2006]

- May: $60/Ton
- Jun: $70/Ton
- Jul: $65/Ton
- Aug: $70/Ton
- Sep: $80/Ton
- Oct: $120/Ton
- Nov: $80/Ton
- Dec: $80/Ton
- Jan: $70/Ton
- Feb: $80/Ton
Binder Costs

![Graph showing the trend of binder costs from June 1999 to February 2006. The costs are measured in dollars per gallon, and there is a general increase over time.]}
Major Issue No. 2:
Material Shortages
Aggregate Shortages

• High demand
• Superpave impact
  – Dramatically reduced usage of Central & North Florida Limestone
  – Dramatically increased usage of out of state materials
    • Granite: Georgia & Nova Scotia
• Transportation issues:
  – Rail, shipping & trucking
• Lake Belt Mining Ruling?
Aggregate Sources

- Aggregate mine
- Aggregate terminal
Asphalt Binder Shortages

• Increased demand for asphalt in the eastern US
  – Warmer winter

• Reduced Supply:
  – Reduced asphalt production – Gulf Coast
  – Katrina
  – Economics

• Limited storage facilities in Florida
  – Rely on terminals at ports
  – No refineries

• Peninsular Florida out of binder since January ‘06
Binder Sources

- Asphalt Terminal
Crude Oil
Transportation
Refineries
Historical Asphalt Supply/Demand

Millions Tons - Liquid

- Supply
- Demand

<table>
<thead>
<tr>
<th>Year</th>
<th>Supply</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>1995</td>
<td>45</td>
<td>32</td>
</tr>
<tr>
<td>2000</td>
<td>35</td>
<td>31</td>
</tr>
<tr>
<td>2003</td>
<td>33</td>
<td>32</td>
</tr>
</tbody>
</table>
Gulf Coast Oil and Natural Gas Operations

<table>
<thead>
<tr>
<th></th>
<th>Gulf of Mexico</th>
<th>Total U.S.</th>
<th>% from Gulf of Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil production (million b/d)</td>
<td>1.5</td>
<td>5.5</td>
<td>27%</td>
</tr>
<tr>
<td>Natural Gas production (bcf/d)</td>
<td>10.6</td>
<td>52</td>
<td>20%</td>
</tr>
<tr>
<td>Refinery Capacity (million b/d)</td>
<td>8.1</td>
<td>17</td>
<td>48%</td>
</tr>
<tr>
<td>of which in LA and MS</td>
<td>3.1</td>
<td>17</td>
<td>18%</td>
</tr>
<tr>
<td>Crude Oil Imports (million b/d)</td>
<td>6.5</td>
<td>10.8</td>
<td>60%</td>
</tr>
<tr>
<td>of which into LA and MS ports</td>
<td>2.5</td>
<td>10.8</td>
<td>23%</td>
</tr>
</tbody>
</table>

Source: U.S. Energy Information Administration
Binder supply should stabilize… unless something else happens to unstabilize it!
New State Tourism Campaign:

Coming to Florida?  Coming to Florida?

Bring some rock….or binder!
Major Issue No. 3:

FDOT Response to Issues 1 & 2
FDOT Actions

- Construction specification changes
  - Removing unnecessary restrictions
  - Simplifying (dropping PWL)
  - Opening up materials usage
- Looking at developing “strategic reserves” of aggregate
  - Purchase & stockpile aggregate for use on FDOT projects
  - Help to develop aggregate delivery infrastructure
- Considering FDOT owned & operated mines
FDOT Actions

- Considering Regional Asphalt Plant Facilities
  - Property owned by FDOT
  - Permitted for asphalt plant
- Considering reducing night work
- Hot In-Place Recycling
- Generic HMA specification
Major Issue No. 4:

Actual Pavement Stuff
Hot Issues

• Value Added Asphalt Pavements
  – 3 year performance “guarantee”

• Pavement Noise
  – UCF Research contract to look at typical pavement noise in Florida
  – Wayside/OBSI/CPX
  – Determine if FDOT participates in QPPP
Hot Issues

- **Smoothness**
  - Working on an incentive/disincentive spec
  - High speed laser profiler
  - Not sure how to handle bumps...

- **Friction**
  - Porous Friction Course in Jacksonville
    - PEM 1¼”
  - Bonded Friction Course
    - Novachip and variations
  - Friction data
    - Granite/Limestone issue
Hot Issues

• Performance:
  – Cracking still primary mode of failure
  – Longitudinal wheelpath
  – Top-down

• Looking at improved materials
  – Binder
  – Gradation
Hot Issues

- Lack of experience
  - Losing experience at all levels
  - In all areas
    - Design/Construction/Materials
    - All entities:
      - Contractor/FDOT/Consultants/FHWA
  - Big problem....