Competition Paves
Enhanced Stewardship Opportunities with Competition

Virginia Concrete Pavement Conference
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Virginia – Transportation by the Numbers

- Miles of Public Road?
- Vehicle Miles?

Source: USDOT BTS
## Virginia — Transportation by the Numbers

**STATE AND LOCAL GOVERNMENT TRANSPORTATION REVENUES AND EXPENDITURES**

*Millions of current dollars, 2012*

<table>
<thead>
<tr>
<th>Mode</th>
<th>Revenues</th>
<th>Expenditures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highway</td>
<td>1,660</td>
<td>4,248</td>
</tr>
<tr>
<td>Transit</td>
<td>116</td>
<td>523</td>
</tr>
<tr>
<td>Air</td>
<td>875</td>
<td>1,378</td>
</tr>
<tr>
<td>Water</td>
<td>299</td>
<td>396</td>
</tr>
</tbody>
</table>

*Source: USDOT BTS*
Challenge

- Lots of movement of people and goods
- System is saturated
- Massive economic impacts
  - Growth is predicated on efficient movement
- Huge funding gap (not financing…)

What is **Concrete Pavement**’s role?
Relates to COMPETITION!

Probably the single-most overlooked aspect of getting the most from our pavement investment!

- Including concrete can spur competition!
- This provides VALUE to the agency/owner
- Agencies benefit from presence of both pavement types!
- About extending the purchasing power of the highway dollar
Competition Lowers Material Prices

- Not about concrete pavement being better…
- Agencies benefit from having more than one alternative
- No engineering reasons why concrete pavement cannot be part of an agency’s program
  - We know this from WI, IA, CA, TX, FAA, DOD etc.
  - Smooth, fast, cost effective, etc.
- Competition is foundational to the American way of doing business…
COMPETITION BETWEEN PAVEMENT INDUSTRIES ASSURES THERE IS AN ADDITIONAL LEVEL OF COMPETITION

Contractor Competition
- Limits competition at the supplier level, which can limit effectiveness

Industry Competition
- Assures competition happens between contractors and suppliers

Multiple contractors does not assure competition takes place at all levels of the supply chain.
Competition Spurs Innovation

- Forces innovation and technology development
- Makes both products better and the public benefits
- Concrete pavement advancements come from places with healthy competition e.g. slipform, stringless, two-lift, concrete overlays, NGCS, fabric interlayer.
Competition Improves Quality

- Healthy competing industries can afford to invest in
  - Training
  - Education
  - Quality Control
- Investing in workforce lowers risk and reduces costs
- Competence and quality benefit agencies…
Of course, this is nothing new...

- Early years of US Federal Aid Program
- Public instances of fraud, abuse, collusion...
- Congress and public lost confidence in administration of program (largest ever - $27B)
- Investigations (FBI, GAO, Blatnik)
- BPR → AASHO compelled to develop guidelines to restore confidence in program
The Role of Competition

- 1960 AASHO Guide on Project Procedures
  - Includes *Pavement Type Selection*...
1960 AASHO Guide

- Covers a lot of information... aim “to assure the public of full value for their highway dollar.”
- Established process based on transparency, and sound engineering while leveraging benefits of free market dynamic through healthy and spirited competition (includes host of factors)
- Despite advancements in design and modeling, authors warn that PTS process only meaningful in presence of competition between industries.
In section on cost comparisons (LCCA): *doubt as to the validity [of such analysis] arises in the case where one type of pavement has been given monopoly status by the long-term exclusion of a competitive type.*

I.e., the cost-data is not meaningful...

“...desirable that monopoly situations be avoided...”

Highway officials recognized the benefits of establishing competing industries.
So... What’s the Problem?

- Competition is often not recognized or considered appropriately by decision makers today.
- Agencies are NOT adequately capitalizing on the benefits of competition between paving industries.
Competitive Paving Program?

2013 Industry Market Analysis

From 2013, 5-year rolling average balance of DOT pavement type, based on Oman Systems bid tabulations.
ACPA analysis of current bid tabs confirm benefits

**Asphalt ($/ton)**

**Unit Price versus Share of Pavement Spending on Asphalt**

- **Average unit price = $78.72** (with 100-90% asphalt share)
- **Average unit price = $61.85** (with 70-60% asphalt share)

*Source: OMAN, Bid Tabs Software – Public Data.*
ACPA analysis of current bid tabs confirm benefits

**Source:** OMAN, Bid Tabs Software – Public Data.

**Things to note:**
- **Average**
- **Scatter**

**Graph:**
- **Concrete ($/SY)**
  - Unit Price versus Share of Pavement Spending on Asphalt
  - Average unit price = $63.71 (with 100-90% asphalt share)
  - Average unit price = $31.94 (with 70-60% asphalt share)

**Increased Competition**
Theory of Competition Threshold & Price Impact

## Competitive Paving Program

Same data viewed through a break-even analysis...

<table>
<thead>
<tr>
<th>Budget</th>
<th>Asphalt Portion of Budget</th>
<th>Expenditure on Asphalt (millions)</th>
<th>Asphalt Unit Price ($/ton)</th>
<th>Tons of Asphalt</th>
<th>Expenditure on Concrete (millions)</th>
<th>Concrete Unit Price ($/SY)</th>
<th>Square Yards of Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>$200 M</td>
<td>100%</td>
<td>$200</td>
<td>$78.72</td>
<td>2,540,650</td>
<td>$-</td>
<td>$63.71</td>
<td>-</td>
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<tr>
<td>$200 M</td>
<td>95%</td>
<td>$190</td>
<td>$78.72</td>
<td>2,413,618</td>
<td>$10</td>
<td>$63.71</td>
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<tr>
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<td>90%</td>
<td>$180</td>
<td>$78.72</td>
<td>2,286,585</td>
<td>$20</td>
<td>$63.71</td>
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<tr>
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<td>70%</td>
<td>$140</td>
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<td>2,263,541</td>
<td>$60</td>
<td>$31.94</td>
<td>1,878,522</td>
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<tr>
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<td>65%</td>
<td>$130</td>
<td>$61.85</td>
<td>2,101,859</td>
<td>$70</td>
<td>$31.94</td>
<td>2,191,609</td>
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<tr>
<td>$200 M</td>
<td>60%</td>
<td>$120</td>
<td>$61.85</td>
<td>1,940,178</td>
<td>$80</td>
<td>$31.94</td>
<td>2,504,696</td>
</tr>
</tbody>
</table>

MORE PAVEMENT FOR SAME INVESTMENT (~187 lane-miles)!
MIT performed a comprehensive multivariate analysis of DOT bid pricing data

- 10 years of data, 298,000 pay items, 164,000 jobs, 47 state DOTs...

“...increasing competition between paving material industries lower paving costs for both asphalt and concrete jobs. This is likely to result in significant savings for DOT’s and taxpayers.”
In Brief…

● Competitive two-pavement system lowers prices, spurs innovation, improves quality, and can enhance network performance.
  ● Supported by guidance, gut and bid data...

● Allows agencies to build more pavements (~15% more) for same investment, and manage assets more cost efficiently...

● Yet, here we are…
What can you do right now?

1. Signal that you are committing to a program of concrete pavement projects - industry will respond!

2. Address concrete pavement first-cost
   - Optimize pavement designs – use MEPDG to incorporate features that are cost effective (i.e. performance benefits outweigh lifecycle costs)
   - Develop project-specific solutions – there is more than one way to meet performance requirements.
   - Examples: Widened lane, free-draining base
What can you do right now? (continued)

3. Diversify your concrete solutions portfolio across applications
   - Benefit from competition in more than the reconstruction or new construction market.
   - Also applies to treatments on asphalt and composite pavements.
   - Reduces long term risk...
   - Example: Concrete Overlays

overlays.acpa.org
Example: Recent Example of Concrete Overlay

State Highway 13 – North of the city of Craig, CO

SH 13 Existing Condition before overlay

Bid December 2015 as AD/AB

Hot Mix Asphalt (HMA) Alternative

- 2-in SX(75) PG 58-34 (surface AC) over 4-in of SX(75) PG 58-28 (Base AC) over 8-in of FDR
  - Initial Const = $5,385,980.85
  - Rehab & Maint = $2,456,560
  - Users Cost = $596,170
  - Total Life Cycle Cost = $8,438,710.85

Concrete Alternative

- 6-in Unbonded Concrete Overlay on Asphalt
  - Initial Const = $5,338,308.82
  - Rehab & Maint = $1,674,060
  - Users Costs = $718,490
  - Total Life Cycle Cost = $7,730,858.82

Concrete overlay was $47k lower in Initial cost & $708k Lower in Life Cycle Costs
Opportunity with Concrete Pavements...

- With COMPETITION between paving industries come opportunities to enhance stewardship through:
  - Cost savings
  - Innovation
  - Quality/Perf.

- As competition increases between industries, unit costs drop for both, regardless of PTS process...
- Enabling VDOT to better address the transportation needs and the impending funding gap.

“In the middle of difficulty lies opportunity.”
Albert Einstein