A National Perspective on Opportunities with Concrete Pavements, Alternate Design Alternate Bidding, and other stuff...

TENNESSEE CONCRETE PAVEMENT & CEMENT-BASED SOLUTION CONFERENCE
NASHVILLE, TENNESSEE
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ACPA: Who are we?

A Unified Voice for the Concrete Pavement Industry!
- Recent Refocusing Effort
- National Core Mission
- Efficient and Effective Delivery of Strategic Goals with Partners
  - Chapters
  - Agencies
  - Cement & Concrete Industry
  - National CPTech Center
ACPA: Re-Focused and Fine-Tuned

A Unified Voice for the Concrete Pavement Industry!

- Advocating for INRASTRUCTURE INVESTMENT in Washington
- Providing GUIDANCE for concrete pavement
- Developing TOOLS for the betterment of the concrete pavement industry
- Delivering TRAINING and certification programs
- Guide RESEARCH and deployment

THANK YOU for your support!
Concrete: What’s the idea?
Concrete is EVERYWHERE

- Concrete is used more than any other man-made material in the world
- The most recycled material in the US
What percent of cement usage in the US is for concrete pavements?
U.S. Roadway Length (miles)

- Street/Road: 3,790,000
- Highways (NHS): 160,000
- Highways (Interstates): 47,000
Surface Share (Interstate Highway System)

Source: FHWA Highway Statistics
Original Interstates

>99% Concrete
90-98% Concrete
<90% Concrete
Where do we pave with concrete?

2010 Info. – All Uses (Hwy, Air, Streets/Roads) Considered

- No Data or No SY
- Less than 0.5M SY
- 0.5M to 1M SY
- 1M to 2.5M SY
- 1M to 2
- 2.5M to 4M SY
- 2.5M to 4
- +4M SY
U.S. Concrete Paving Across Time

Source: Calculated from Square Yard paving items. Data from states reported in ACPA’s Publication "Pavement Market Quarterly"
What’s the opportunity?
Opportunity for Tennessee?

Major opportunity revolves around **competition**

A *two-pavement* system increases competition!

- Lowers prices
- Spurs innovation
- Improves quality

A stronger balance of pavement types give agencies more bang for the buck!
Two-Pavement System!

Figure 1. 2011 weighted unit costs versus five-year average balance of state pavement type usage (based on publicly available data in Oman Systems bid tabulation database).
# Two-Pavement System!

*Table 1. Break-even analysis for $200 million per year budget for pavements*

<table>
<thead>
<tr>
<th>Budget</th>
<th>Concrete Portion of Budget</th>
<th>Expenditure on Asphalt ($)</th>
<th>Asphalt Unit Price per Figure 1 ($)</th>
<th>Tons of Asphalt</th>
<th>Expenditure on Concrete ($)</th>
<th>Concrete Unit Price per Figure 1 ($)</th>
<th>Square Yards of Concrete</th>
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</thead>
<tbody>
<tr>
<td>$200 M</td>
<td>0%</td>
<td>$200 M</td>
<td>$74.80</td>
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</tbody>
</table>
This is nothing new!

Acknowledged since beginning of Federal Aid!

It is desirable that monopoly situations be avoided and that improvement in products and methods be encouraged through continued and healthy competition among industries involved in the production of paving materials.

Clearly the authors recognized the value that competition plays in providing value to the public!
What’s in the 1960 AASHO Guide?

- This approach not only fosters competition, but it ensures healthy paving industries that can afford to invest in:
  - Quality Control
  - Training
  - Research

- This in turn means better performing pavements and maximum value to public!
This is nothing new!

This is de-facto federal PPS policy (as of 1981)

Four key issues:
1) Evaluation per 1960 AASHO
2) Use of LCCA
3) Timeliness
4) Alternate Bids
This is no joke!

As the 1960 guide notes...

“It is imperative that all possible and proper measures be taken to ensure the taxpayers of this country that they are receiving full value of every highway dollar spent... The recommendations are designed to keep the public confidence in the highway program at a maximum.”

Large sums of public funds!
How ensure competition?
Alternate Design Alternate Bidding

- ONE WAY… is to use ADAB
- Important: ADAB is a means to an end
- The objective is to STIMULATE COMPETITION!
- If the ADAB process does not stimulate competition, the process is faulty…
What is a good ADAB process?

- FHWA issued a Technical Advisory on ADAB in Dec 2012.
- Lists factors to be considered, including:
  - Equivalent Designs
  - Discount Rate
  - Price Adjustment Factors
  - Material quantity specifications
  - Consistent with 1981 policy and NCHRP
FHWA TA on ADAB (2012)

FHWA considers ADAB a suitable PTS method

- Alternate pavements designs should be equivalent (MEPDG)
- Discount rates should be consistent with OMB circular A-94
- M&R strategy selected for each alternative pavement should reflect realistic agency pavement management practices.
- An LCCA bid adjustment should be used for all ADAB projects
- Use of escalators is not desirable for ADAB
- The agency should use the same type of method for materials quantities.
Alternate Bidding Process

- Increasingly, states are embracing ADAB as a means to stimulate competition.
- ADAB is not necessarily the answer – it is a tool!
- Success is measured by:
  - Competition enhanced? (number of bidders)
  - Pricing improved?
  - Spurring innovation in process?
- ADAB can be of value to agencies, where competition is not currently part of the market!
Markets Using Alt. Bidding...

As of: March 16, 2011

Note: Numbers indicate year of implementation (EX = experimental).
Alternate Bidding Impact...

Alt. Bidding Used

FHWA Issues Policy Clarification
at Request of ACPA National

As of: March 16, 2011
Alternate Bidding

- Alternate bidding is good for agencies
- States are hungry for ways to make highway dollars reach farther
- With better FHWA guidance, implementation will only grow!

*Is Tennessee benefitting from effective implementation of this ADAB tool?*
OTHER EXCITING OPPORTUNITIES
Evolving Technologies

- New and exciting concrete pavement technologies
- Agencies can benefit from these improvements through an embrace of concrete pavements
Evolving Technologies

Often developed in states where healthy industries are competing against each other!

These are also FHWA supported technologies through:

- ACPT program
- Every Day Counts
- MAP-21 AID-PT (in development)
- SHRP-2
Evolving Technologies

Is Tennessee benefitting from this evolution in concrete pavement technology?
Growth in Thin Overlay Use

Square Yards, Thin Bonded Overlays (6 in. or less)

Industry and FHWA Advances
Plus Change in Materials Cost
Competitiveness Drives Demand

7,000
450,000
1,200,000
5,456,000
1,200,000
3,227,000

Total by 1993  Total by 1999  Total by 2004  2009  2010

Note: Some thin overlays in Iowa counties and other states have been used for many years. This measure of bonded overlays on asphalt illustrates growth specific to this technique. Refinement of this measure will be necessary to breakdown the segmentation of overlays for more insight.

As of: March 16, 2011
Adoption of Overlays...?

All Markets (Hwy, Air, SLR) Considered

- Accepted/Routine
- Just Starting or Occasionally Build
- Do Not Use

As of: March 16, 2011
Non-woven Fabric Interlayer for Unbonded Concrete Overlays...
Stringless paving technology for milling and slipform paving...
Variable-width paving...
Two-lift Construction (wet on wet)...
Curing compound application altered per evaporation rate on site...

(Smart Cure)
Next Generation Concrete Surface for Tire-Pavement Noise Control
What can we learn from this?
What have we learned?

- Significant financial opportunities for TN with implementation of a two-pavement system:
  - Enhance the purchasing power of TN highway dollar
- ADAB (properly implemented) can get you there!
  - FHWA guidance is helpful
- Lots of exciting concrete pavement technologies (recent advancements) that TN can reap the benefits from more effectively
What have we learned?

- Adoption of concrete pavements can have a huge positive impact on Tennessee taxpayers and road users!
Thank You!

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