The Real Story Between Asphalt And Concrete Paving

14th Annual Conference Association of Modified Asphalt Producers San Antonio, Texas

Welcome to Texas









Enjoy San Antonio







The first Texas city to experience Warm Mix Asphalt

SPREAD THE WORD...

• DON'T TEXT AND DRIVE

DO NOT BE
DISTRACTED

FAMILY, FRIENDS AND NEIGHBORS

Focus on Driving

The TEXT can wait

GET HOME SAFE

I Love Asphalt

- Most everything I do revolves around Asphalt
 - Career
 - Great asphalt products with great benefits
 - Great people
 - Innovative and Important Industry
 - Recreation
 - Tour the Country on a Goldwing
 - Go to NASCAR Races
- I share your Passion for Asphalt



GOOD GUYS

- National Asphalt Pavement Association
- Asphalt Institute
- Asphalt Pavement Alliance
- National Center for Asphalt Pavement Technology
- State Asphalt Pavement Associations
- Association of Modified Asphalt Producers

GOOD GUY'S WEB SITES

- Asphaltroads.com
- AsphaltFacts.com
- Pavegreen.com
- Porouspavements.net
- Quietpavements.com
- Beyondroads.com
- Ownyourroad.com
- Warmmixasphalt.com
- FavoriteRoad.com

GOOD GUYS

Engineering Performance

 Smooth, quiet, ease of maintenance, speed of construction, perpetual pavements to thin overlays, QUALITY

Economic Benefits

- Initial cost, life cycle costs
- Environmental Stewardship
 - Recycle, Reuse, Reduce

The Competition

- Portland Cement Assn.*
- National Ready Mixed Concrete Assn.*
- RMC Research Foundation
- American Concrete Pavement Assn.*
- American Concrete Institute
- National Concrete Pavement Technology Center
- American Society of Concrete Contractors
- Concrete Reinforcing Steel Institute
- Precast Concrete Association
- International Grinding and Grooving Assn.
- MIT Concrete Sustainability HUB
- Environmental Council of Concrete Organizations
- * State Associations

The Competition's Web Sites

- Think-harder.com
- Pavements4life.com
- Concretethinker.com
- Greenhighways.org
- Concretestreets.org
- Concreteanswers.org
- Concreteparking.org
- Greenconcrete.info
- Perviouspavements.org
- Cptechcenter.org
- Web.mit.edu

Texas Cement and Concrete Industry Facts:

- Texas is the largest cement-producing state, making 11.6 million tons, or 15% of all U.S. production in 2012.
- Texas is the largest consumer of cement, utilizing 13.7 million tons or 16% of U.S. consumption in 2012.
- Nine cement companies have operations in Texas (Alamo, Ash Grove, Buzzi Unicem, Capitol, Cemex, GCC Rio Grande, Holcim, Texas Industries, and Texas Lehigh).
- Five of these companies have corporate or U.S. headquarters in Texas (Alamo, Capitol, Cemex, Texas Industries, and Texas Lehigh).

Texas Cement and Concrete Industry Facts:

- Eleven cement plants are located in Texas (in Bexar, Comal, Ector, Ellis, Hays, and Nolan counties).
- Additionally, there are approximately 500 ready-mix concrete plants, 240 concrete products plants, and 1,500 concrete, masonry and stone contractors in Texas.
- The cement, concrete, and related industries employ over 44,000 workers in Texas directly, and over 115,000 indirectly, for a total of 1.4% of total state employment, and a total payroll of \$1.7 billion.

Cement Producers

- Voluntary code of conduct in 1991
- Reduce emissions land, water, air
- Responsibly manage waste, energy and material conservation
- Alternative fuel and material solutions
- Energy use down 37%, kiln dust down 75%, alternate fuels 65% of plants, alternate materials 45%

What The Competition is Saying

April 12, 2012 at 3:37 PM

- If you're TxDOT, a local road agency, or a developer/contractor that builds pavements, hold on to your hats...asphalt prices are taking off again!
- Engineering News Record, in its March 26, 2012 edition "<u>1Q Cost Report</u>" trumpeted the headline "Higher Oil Prices Hit Asphalt." The article notes a 2.3% rise in asphalt paving mixtures in February alone, with an 11.2% rise cited from February 2011. This rise is negatively affecting asphalt contractors; for instance Vulcan Materials' profits dipped nearly 40% in the fourth quarter 2011, compared with the same period in 2010. Vulcan points to "the higher input costs of liquid asphalt."
- Transportation agencies are also severely impacted. The Ohio DOT's director Jerry Wray noted that "Inflation has affected our budget and our ability to build and maintain our transportation infrastructure, further tightening our already overstretched budgets."
- ENR referred to the Portland Cement Association's estimates that the 41 states with asphalt price escalation clauses incurred an estimated \$70 million in overruns due to asphalt cost increases not accounted for in base bids. Though TxDOT (presciently) does not have an asphalt escalator clause, contractors will add a "risk" factor in the pricing of asphalt bid items. They know that asphalt escalates rapidly, and that the escalation is quite volatile.

- How can transportation agencies, and their contractors, better manage the cost overruns and volatility? Well, they can begin by focusing on the many concrete and cement paving solutions available. Concrete cost escalation has been essentially flat over the last three years. And in the years prior to that, escalation behaves at a slow, predictable pace, unlike asphalt.
- You can see a comparison of concrete and asphalt price indexes in our info sheet "<u>Concrete Paving Get More, Pay Less</u>." Between 2006 and 2012, asphalt increased by a whopping 88%, while concrete rose only 15% (and, as noted, not at all in the last three years).
- And besides traditional full-depth concrete paving, our industry has many other alternatives, such as:
- Concrete overlays directly on existing asphalt (or concrete) pavements
- In-place recycling of your worn out asphalt streets with full-depth reclamation (and a thinner asphalt surface on top, compared to base replacement with unstabilized flex base).
- Roller-compacted concrete for streets or inlays.
- Consider concrete and cement solutions...now inch-for-inch, concrete can be less expensive than asphalt on a *first cost* basis.
- (Download: CCT Info Sheet "<u>Pavement Solutions for Streets and Local Roads</u>" and the National Concrete Pavement Technology Center's "<u>Guide to Cement-Based</u> <u>Integrated Paving Solutions</u>" for a discussion of concrete and cement paving alternatives; and PCA's chief economist Ed Sullivan's report on "<u>Paving: The New</u> <u>Realities</u>" for a discussion of concrete's widening cost advantage over asphalt.)



Prices: 2006-2012 Asphalt Up 88% Concrete Up Only 15%

Concrete Sustainability

- People responsible for the management, design, construction, maintainenace and rehabilitation of the deterioting network of pavements are overwhelmened.
- What is needed is a new approach. The implementation of truly sustainable pavement solutions that result in reduced economic cost over the life cycle, lessened environmental impact, and enhanced societal benefit, while maintaining the system in a high level of service for perpetuity.

Sustainable Must be Durable

- Optimal material utilization less waste
- Lower maintenance cost and congestion due to construction
- Lower total cost of ownership
- Longer life = smaller eco footprint
- Lower community impact

Fuel Mileage

• Higher surface stiffness and smoother surfaces have been shown to reduce fuel consumption between 3% and 17% as compared to asphalt pavements. At today's price of fuel, around \$3.50 per gallon, consumers may realize a substantial savings at the gas pump. (Aredekani, 2010). "A new study by civil engineers at MIT (Massachusetts Institute of Technology) shows that using stiffer pavements on the nation's roads could reduce vehicle fuel consumption by as much as 3 percent — a savings that could add up to 273 million barrels of crude oil per year, or \$15.6 billion at today's oil prices. This would result in an accompanying annual decrease in CO2 emissions of 46.5 million metric tons." (Brehm, 2012).

2012 Florida International University Research

- 3.8% more miles per gallon on rigid pavements vs asphalt pavements
- If all pavements within the Florida highway system were rigid:
 - Fuel savings of 500 mil. gallons
 - Annual savings to public, \$2 billion
 - CO2 emissions reduced by 5.2 billion metric tons

More Sustainable Ideas

- Rigid surface less deflection=less rolling resistance NRC Canada study on trucks saved 0.8-6.9% mpg on concrete pavement = more CO2 saved during use than in manufacturing
- PCA Parking Lot study lighting and energy, 37% energy savings or \$28 per space per year
- Reduced lighting and energy requirement fewer fixtures
- Improved pedestrian and vehicle safety
- Improved Urban Heat Island benefits with lighter colored pavements

Concrete Paving Industry Status

Industry holding strong

- Have solutions
- New, exciting technologies
- Agencies embracing competition between pavement types
- FHWA support on many technologies

Concrete Overlays

- Growing market significant efforts last 5 years
- Bonded = 2-5" routine maintenance, preventative maintenance, minor rehab
- Unbonded = 6-11" restore structural capacity
- More unbonded with fabric interlayer than bonded
- 60% are over asphalt
- Half are 6" or less
- Preservation and resurfacing

Stringless Paving

- Alternative to conventional stringline paving
- Uses electronic guidance systems
- Controls elevation and steering of pavement machines
- Referred to as 3-D paving creates a 3-D model of project
- Truer profile Smoother Pavement

2 Lift Concrete Pavement

- Bottom layer mixes with recycled aggregates with a lower cement content
- Top lift mixes with harder more durable aggregates and titanium oxide cement (smog eating)
- Makes product sustainable and cheaper in both lifts

2 Lift Concrete Pavement Optimization

- Optimized gradation and less cement content
- Replace virgin aggregate with recycled in bottom layer
- Can use Fractionated RAP

Roller Compacted Concrete

- Placed with tamper bar paver
- No slump compacted by vibratory rollers
- No forms, no steel, no finishing
- Parking lots, industrial plants, railroad intermodal terminals, military tank hard stands, airfield applications, highway shoulders, detours, low volume city and county streets

Next Generation Concrete Surface

- A hybrid saw cut texture developed to provide the <u>quietest surface</u> for concrete pavement
- Constructed in a multi-pass operation using conventional grinding equipment
- Provides a <u>smoother ride</u> than any other surface available
- Longitudinal groove channels provide increased drainage resulting in safer wet weather performance

Pre-Cast Concrete Panels

- Pre-cast concrete panels placed on the roadway
- IH-35Frontage road in Georgetown, Tx used 10x10 panels as a pilot project

Concrete Industry

- Adapting to preservation mode
- Advocate Smarter
- Filling agency resurfacing needs is major new opportunity
- Sustainability is the future

Being Engaged

- We have a lot of solutions and innovations of our own
- We have to educate and inform internal and external customers
- Everyone needs to be involved at every level of our industry
- Address the issues and misinformation with facts

Good Guys

- Continue to stay the course
- Continue to support NAPA, AI and APA Programs
- Continue to be an active participant in education and training programs
- Continue to focus on QUALITY!

Thank You, Good Guys



