



Asphalt - Life Cycle Costing & Alternate Bid: The Real Story

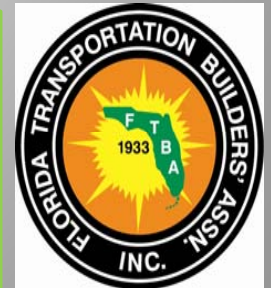
Jim Warren

Executive Director

Asphalt Contactors Association of FL, Inc.



2010 FDOT/FTBA
Construction Conference
Orlando, Florida



Life Cycle Costing: The Real Deal



- What is it?
- How does it work?
- What are pitfalls?
- What are the results?
- The future.



Vernacular

- Pavement Type Selection: *The process which FDOT undergoes to select a particular type of pavement for a project.*
- Life Cycle Costing: *An analytic process that calculates initial and maintenance costs for a pavement over a prescribed analysis period (long enough to force a major rehab in each pavement type).*
- Life Cycle Cost Adjustment Factor: *A dollar figure used to “equal” the differences between two different pavement types – used to determine the winner.*
- Alternative Bidding: *A contracting method that allows different pavement types to be bid for a project.*



How Florida does Alternate Bid?

- Florida Pavement Type Selection Manual.
 - It includes Rehab cycles and primary and secondary factors.
 - Include using Life Cost Analysis.
 - 40 Year Analysis Period
 - 4% Discount Rate
 - Compute a Life Cycle Cost Adjustment Factor to account for difference in future maintenance.
 - <http://www.dot.state.fl.us/pavementmanagement/PUBLICATIONS.shtm>





How does it work?

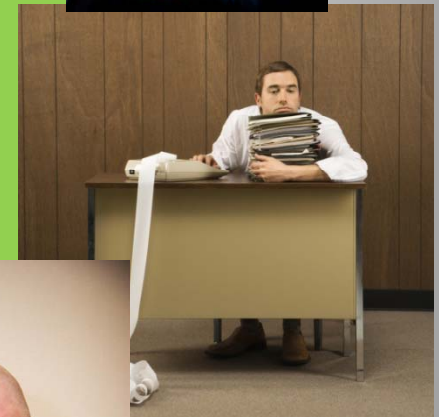


- Calculate the initial cost of the pavement
- Using a table of maintenance actions and intervals, calculate the cost of each maintenance procedure.
- Using a standard discount rate, discount the future costs back to net present value. (*Note: future maintenance will have a lower cost in today's dollars – the further out, the higher the discount.*)
- Add up the *discounted* future costs with the initial cost to get the Life Cycle Cost of each pavement type.



Pitfalls

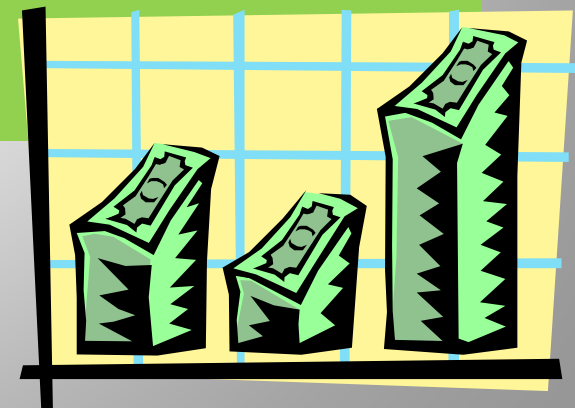
- The numbers... Oh, the many numbers
- The assumptions.. Oh, the many assumptions!
- Lots of calculations.
- Difficult to explain to non technical people
- Initial cost weighted
- First rehab period is key.



Why Alternative Bid?



- To “foster competition”
- The PCC industry petitioned the FDOT to let some Alternate Bid Projects so they could have an equal chance at getting some of the paving market.
- In 2009, FDOT let three projects – lets look at the results.





Example 1:

- SR 80: Hendry County, 1.9 miles
- Asphalt: \$3,591,297 per mile LCC
- Concrete: \$5,790,152 per mile LCC
- LCCF: \$ 531,375
- Concrete 1.6 times as expensive as asphalt.
- No Concrete Bids Received.

Asphalt	Concrete
¾" FC-5	11" Plain Jointed PCC
4 " Superpave TL C	6" Special Subgrade
10" Limerock	
12" Stabilized Subgrade	



Example 2:

- SR 70: St. Lucie, 4.356 miles
- Asphalt: \$2,246,951 per mile LCC
- Concrete: \$4,984,509 per mile LCC
- LCCF: \$ 601,713
- Concrete 2.2 times as expensive as asphalt.
- No Concrete Bids Received.

Asphalt	Concrete
¾" FC-5	11" Plain Jointed PCC
4 " Superpave TL C	4" Asphalt (ATPB)
10" Limerock	1" Asphalt
12" Stabilized Subgrade	12" Stabilized Subgrade



Example 3:

- SR 79: Washington County, 1.7 miles
- Asphalt: \$2,473,982 per mile LCC
- Concrete: \$7,335,269 per mile LCC
- LCCF: \$ 278,322
- Concrete 3 times as expensive as asphalt.
- No Concrete Bids Received.

Asphalt	Concrete
¾" FC-5 (76-22)	9" Plain Jointed PCC
3- ½" Superpave (76-22)	4" Asphalt Base
10" Limerock	12 " Stabilized Subgrade
12" Stabilized Subgrade	



2009 RESULTS

- *Overall, concrete was 2.5 times as expensive as asphalt.*
- *Even with the “LCCA Bid Adjustment” There were... No PCC bids on ANY JOB!*
- *THE BOTTOM LINE:*
 - *Asphalt was 24 million dollars less expensive in Life Cycle Costs over 40 years over the length of these 3 projects.*



2010 Project:

- SR 25 US 27: Palm Beach County: 9.72 miles
- **Mandated** bid both alternate pavements
- Budget Estimate: \$9,485,260
- Asphalt: **230** Contract Days
- Concrete: **1045** Contract Days
- LCCF: \$ 3,843,416
- **Letting March 3, 2010**

Speed
of
Construction?

Asphalt	Concrete
0.75" FC-5	8.5" Plain Jointed PCC
1.5-2.25" Superpave (76-22)	2.25 Milling
2.25-3.5" Milling	



LCC and Alt. Bid. Future

- FDOT undergoing 3rd party engineering review of the FDOT PTS Manual.
- Evaluating MEPDG for Asphalt and Concrete
- PCC Industry is currently lobbying and pushing for a “*Legislative Solution*” to an Engineering issue. Session starts beginning of March 2010
- Asphalt Industry believes it is an Engineering issue and should be left to the FDOT Professional Engineers.



Dispelling A Rumor

- The concrete industry is currently complaining that they are not being treat *fairly* by the FDOT and not getting any work.
- *The REAL Story is this.*
- *2008-2009 FDOT DATA*
 - *Asphalt Materials 4.2M tons, **\$336M***
 - *Concrete Materials 1.6M CY, **\$800M!***



Asphalt - *Proven Performance*

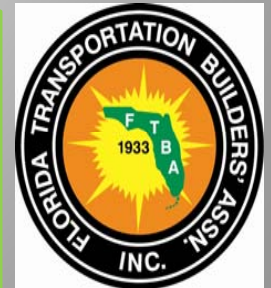
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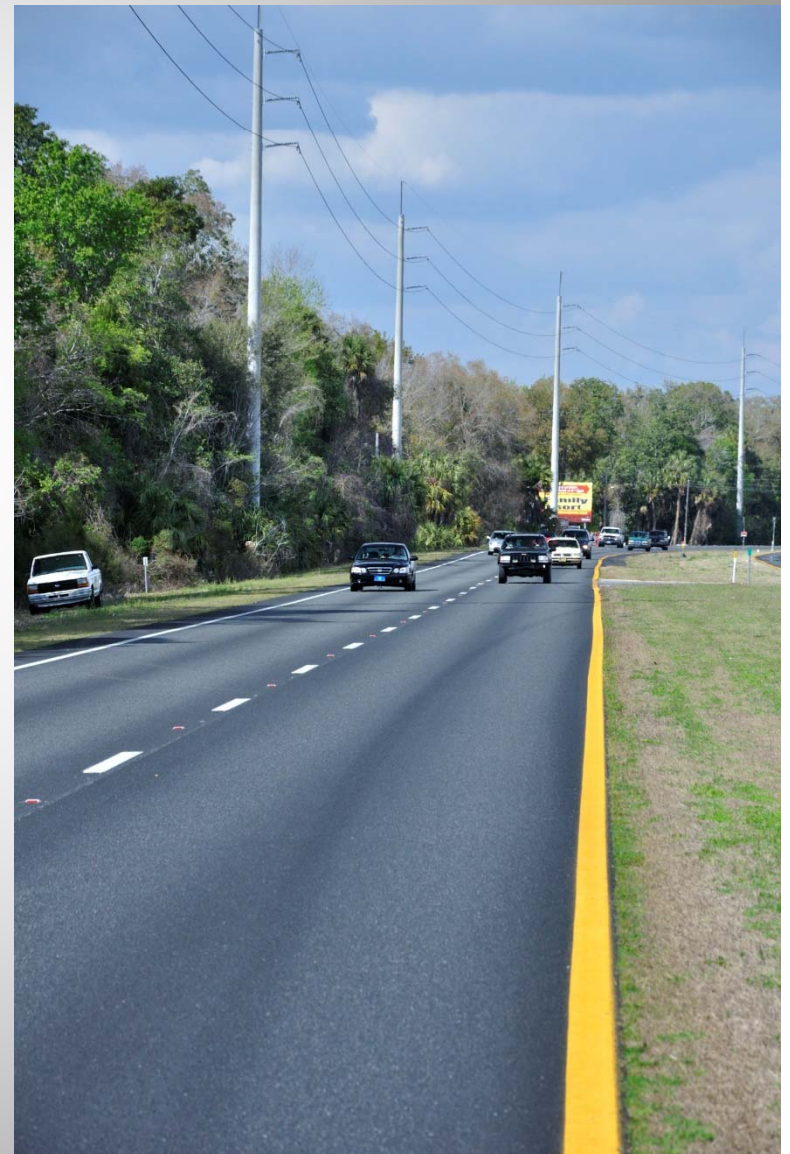


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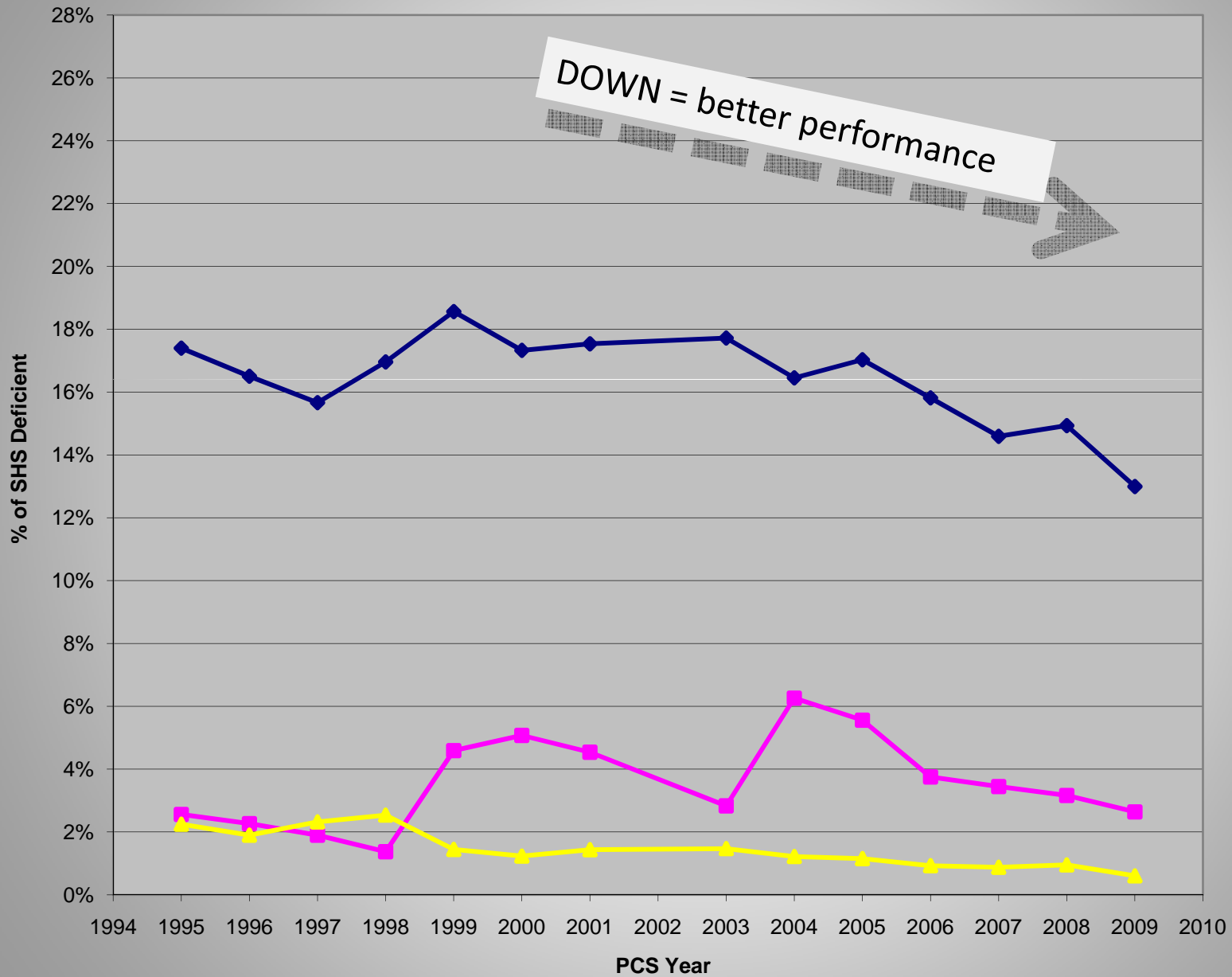
Current FL Statistics

- Statewide 97.72% of the State Highway System (SHS) is Asphalt = 41,401 lane miles
- Any more Questions?

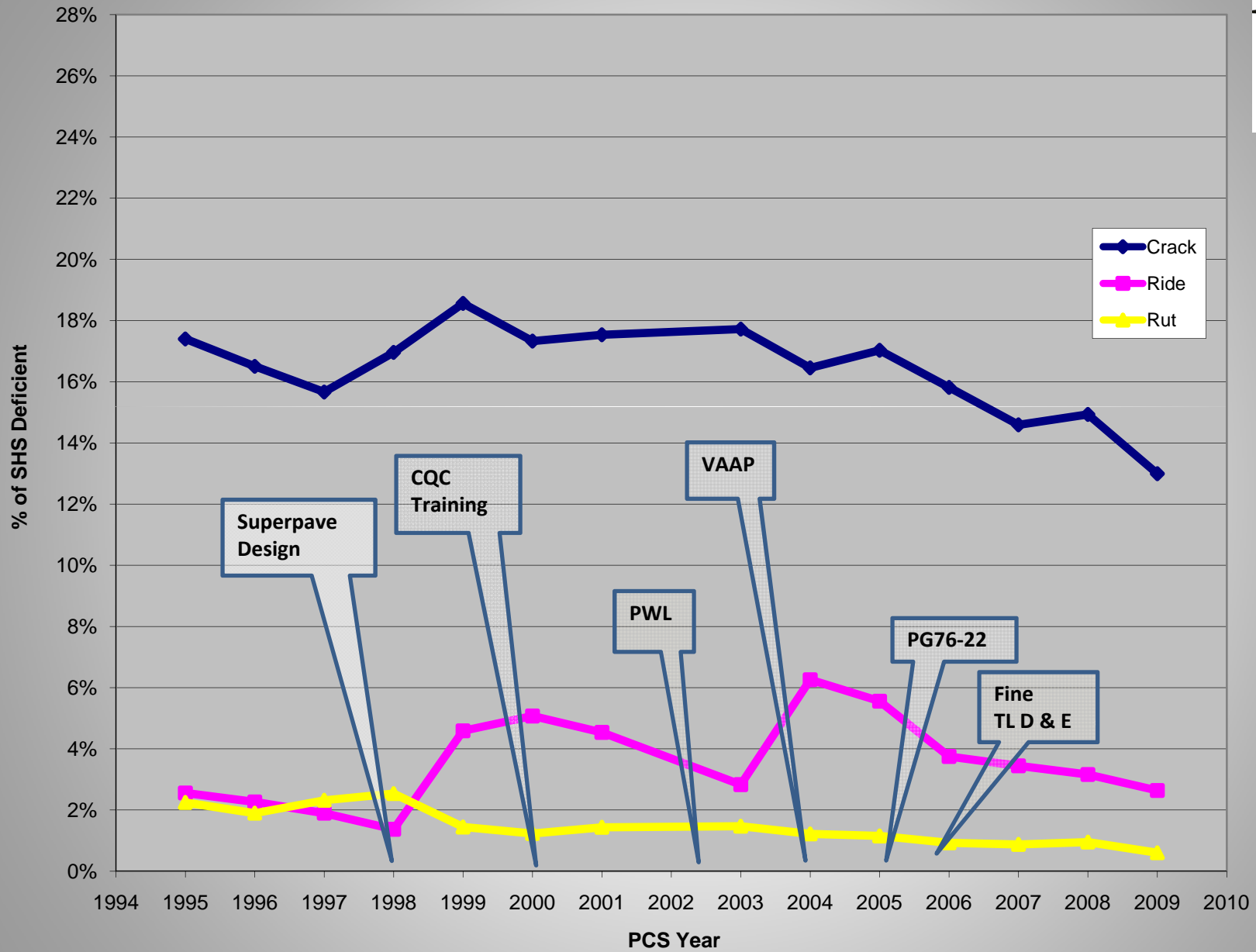




Statewide PCS Data – Pavement Performance



Statewide PCS Data – Pavement Performance





Current Asphalt Statistics

Estimate

14

Years

Asphalt Pavement			
Rehab Period	Urban Arterial	Rural Arterial	Limited Access
14 year	Mill 2", Resf. 1" Str. AC and DGFC	Mill 2", Resf. 3" Str. AC and FC	Mill 3", Resf. 4" Str. AC and OGFC
28 year	Mill 2", Resf. 1" Str. AC and DGFC	Mill 2", Resf. 3" Str. AC and FC	Mill 3", Resf. 4" Str. AC and OGFC

Actual

18.5

Years

Year Rehabilitated	Lane Miles Rehabilitated	Average Rehabilitation Age	Standard Deviation
2004	1931.2	17.7	5.2
2005	1587.2	17.6	5.6
2006	1995.8	17.0	5.3
2007	1872.4	17.4	6.0
2008	1747.3	16.7	5.3
2009	2088.3	18.5	5.8



Current Concrete Statistics

Estimate

20

Years

TABLE 4.1 - Future Rehabilitation Strategies

Concrete			
Rehab Period	Urban Arterial	Rural Arterial	Limited Access
20 year	CPR (3% Slab Replacement)	CPR (3% Slab Replacement)	CPR (3% Slab Replacement)
30 year	CPR (5% Slab Replacement)	Crack, Seal and Overlay ARMI, 4" Str. AC and FC	Crack, Seal and Overlay ARMI, 4" Str. AC and OGFC

Actual

18.4

Years

	LM	Time to First Rehab	LM	Time to Second Rehab
Statewide	1452.5	18.4	868.4	9.5
District One	197.3	15.3	126.9	8.9
District Two	77.5	22.3	34.1	14.3
District Three	858.9	17.2	597.9	8.9
District Four				
District Five	30.6	20.0		
District Six	82.7	22.0	74.7	8.8
District Seven	205.6	23.3	34.8	19.1



Performance: How to improve?

- Focus on Uniformity
- Construction: Let the equipment do the work
- Balance Plant, Trucks, Paving, and Compaction
- Minimize handwork
- Watch the truck exchanges
- Don't empty the hopper between loads
- Communicate, Communicate, Communicate!



Make every ton count!

- Economy of motion
- No wasted effort
- Striving for zero waste and zero re-work.
- In other words, it means ***doing the job right the First Time***, and getting the maximum pay for every ton produced.

Asphalt is...

- The best value for the paving dollar
- The proven performer
- The backbone of the Florida Economy

Asphalt
THE SMOOTH RIDE

