



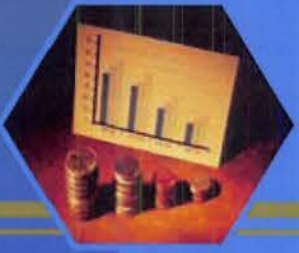
## FLORIDA DEPARTMENT OF TRANSPORTATION



# 2009 STRATEGIC RESOURCE EVALUATION STUDY: Highway Construction Materials

Aggregate Materials

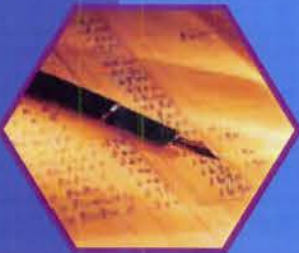
## FINAL REPORT



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## Executive Summary

The Florida Department of Transportation initiated research to strategically assess opportunities and risks in the highway construction materials marketplace. The Department faced unprecedented price volatility during the period of 2005-2008, while the overall Florida economy experienced extreme constraints on both ends of the spectrum – high prices followed by tight credit and very low demand. In any major disruption to the balance of supply and demand, movements in either direction tend to overshoot the mark before restriking that balance.

This update provides data on the existing state of the materials marketplace and outlook as of the end of Fiscal Year 2009. Updated work plan data for the next five years has been obtained, including the impacts of federal stimulus funding; interviews have been completed, and plant surveys have been administered. Results show significant shifts in supplier outlook, operating practices and trendline concerns from one year ago. A sampling of these changes is summarized at the end of this section in **Figure 1**. Materials quantities estimates and econometric modeling for cost and consumption forecasts are provided in summary fashion at the end of this section, and in more detail in each materials section.

### Key Findings:

- With a recession well underway, industry outlooks vary. Business investment – meaning capital expenditures by the private sector like facilities construction, improvements or upgrades – is expected to be negative until the second half of 2010; by definition, government spending currently has the largest influence on materials usage. The government stimulus package is expected to have the most impact on asphalt via resurfacing projects, concrete through bridge replacements and general improvements requiring structural concrete, and aggregate as a component of the first two. Structural steel is likely to see the least impact, due to the nature of its specialized and somewhat random requirements in infrastructure projects; nonetheless, stimulus spending is expected to be the primary driver of structural steel revenues for the next several years.
- Contractors perceive that bureaucratic delays have added several months to stimulus contract awards and do not expect stimulus funding to affect workloads until the fourth quarter of 2009. Fierce competition over dwindling prospects in the market is restraining prices on materials.
- Future Port/Terminal capacity is of critical importance in coming years. Due to the potential volatility of Lake Belt material, the shift in asphalt binder supplier arrangements, and the increasing reliance on granite for pavement friction courses, current and planned capacity at Florida's ports has been examined closely in this report. Detailed information is provided in the respective materials sections.
- FDOT now appears to consume half to one-third of total highway construction materials in the state; 2 years ago, FDOT was estimated at only ¼ of total State consumption. Industry leaders now expect not to reach 2004-5 levels of growth within the next 5 years; in some cases, not within ten. To put

current events into historical context, the last great housing bust in Florida is generally considered the S&L crisis; the state's economy took about 8 years to resume its long-term average growth of 4% for two years running. At this writing, Florida is in its second year of GSP contraction. While countless differences exist between the current scenario and that of the S&L crisis, **Figure 2** shows that if we use that crisis as a guide, industry is probably correct to expect another 5-6 years of below average growth. Plant-level surveys and interviews with managers in a variety of industries support this expectation; suppliers are making changes in their operations to adapt to a new environment of lower long-term growth expectations. Details are outlined in the respective materials sections.

- Companies which undertook aggressive expansion and now carry debt have different outlooks than those with strong capital. Some of this is already reflected in asset sales to former competitors and debt restructuring. Cement and aggregate companies are most affected. Revised strategic plans may spur more industry consolidation and market entrants in some industries over the five-year work plan. Structural steel and asphalt are expected to gain some new participants over the five-year work plan. New competition includes vertical integration from existing competitors, creating competitive supplier advantages, as well as market participants offering new techniques and products.
- Long-term, expectations are that the work plan is more vulnerable in the next ten years than in the past. There is broad concern among suppliers over the declining Gas Tax Revenues, expected Florida General Revenue Fund shortages, and decline in expected population growth. Public sector work declined outside of the stimulus package, but commercial work, which is normally considered higher profit-margin work, has all but disappeared. Numerous capital projects have been cancelled or deferred in multiple industries, as described further herein. Combined, industry expects to plan for smaller capacity needs in the long-term than prior strategic plans may have anticipated.
- We believe that Florida's business climate is transitioning into a "Big state" from a "Growing state". Growth will resume, but mature industries will begin to look more like mature industries in other states – annual growth from value-added products and services will track the state's overall economic growth, or GSP. Industry recognizes this and anticipates a shift away from infrastructure maintenance, and toward congestion relief, as well as other service sectors of the economy. A frequently voiced perception is that this trend will reduce available funding for traditional FDOT work plan programs. Some have suggested that as Federal work increases in the State, this may also alter materials usage patterns, but many contractors felt this would have no impact.
- The cement industry is particularly concerned about regulatory changes. It already has been hit with limits on mercury emissions. In the near future it expects to be required to build capacity for Type II reclaimed water. In addition, it expects a large impact from cap and trade regulations for carbon emissions.

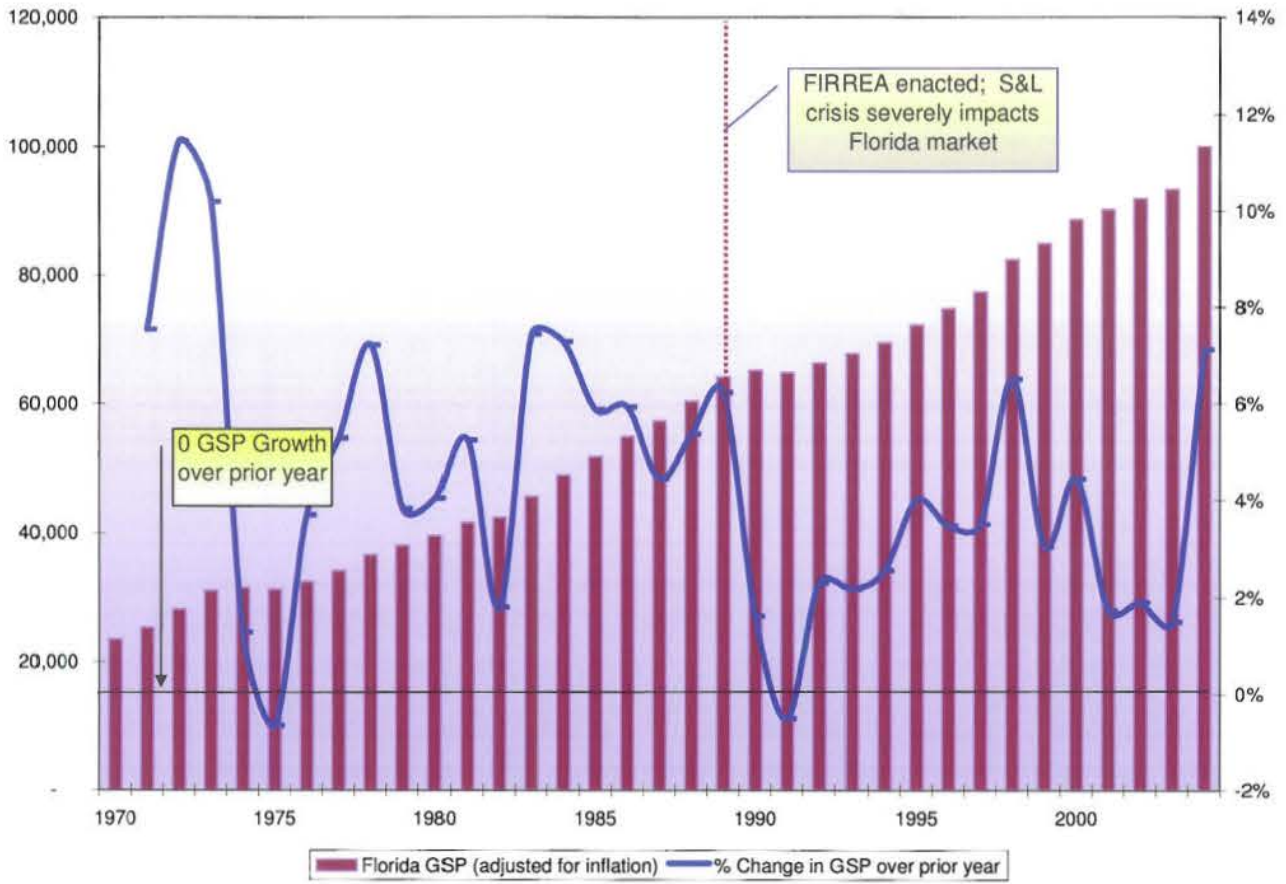
- FDOT's preliminary work plan figures appear to be significantly lower in some areas than the past work plan. While these numbers may disappoint, suppliers can best manage their operating costs, staffing levels and capital investments when equipped with the most accurate information possible. Early and detailed dissemination of planned projects, by work mix category, benefits suppliers by providing flexibility in their options. Suppliers recognize that this information changes over time and can adapt to changes when they are equipped with information on a timely basis. Many firms are working under temporary strategies on the assumption that historical levels of work will resume soon, and these firms will be most vulnerable when those levels are not reached in a one-two year time frame.
- In Florida and across the nation, transportation agencies are experiencing extremely competitive bids; in Florida's case, a projected \$4.2 billion work program in Fiscal Year 2009 required only \$2.7 billion to complete, due to lettings coming in well below engineers' estimates. FDOT redistributed the savings to District Five-Year Work Programs for future lettings. In Fiscal Year 2010, savings of \$392 million have already been recognized (as measured by actual bids versus adopted dollars), and these funds are being used to quickly accelerate projects and let more projects to bid. After FY 2010, the work program is projected to decline by half. FDOT may wish to accelerate some of the projects it had planned to fund with the 2009 savings, both to help "smooth out" the existing rut in the industry and to take advantage of savings while costs are low.

**Figure 1. Summary of Industry Perceptions**

	In Current Year		Within 5 Years		Within 10 Years	
	Asphalt/Cement/Steel		Asphalt/Cement/Steel		Asphalt/Cement/Steel	
	Last Year	This Year	Last Year	This Year	Last Year	This Year
Planning Horizon	N/N/N	Y/Y/Y	Y/Y/Y	Y/N/N	Y/Y/N	N/N/Y
Estimated Probability of:						
Further Industry Consolidation	0/0/0	0/0/0	0/0/0	50/50/75	0/0/0	0/50/75
Crisis in Iran/Venezuela/Nigeria affecting raw material availability	25/0/0	40/0/0	50/0/0	50/0/0	25/0/0	25/0/0
China controlling shipping availability	50/60/25	25/25/50	75/75/50	75/25/75	40/75/75	85/25/100
Relief from Housing Market	45/50/0	50/0/0	50/25/25	50/25/25	25/25/25	75/75/25
Increased Imports	25/0/0	0/0/0	50/50/0	25/0/25	75/0/0	50/25/0

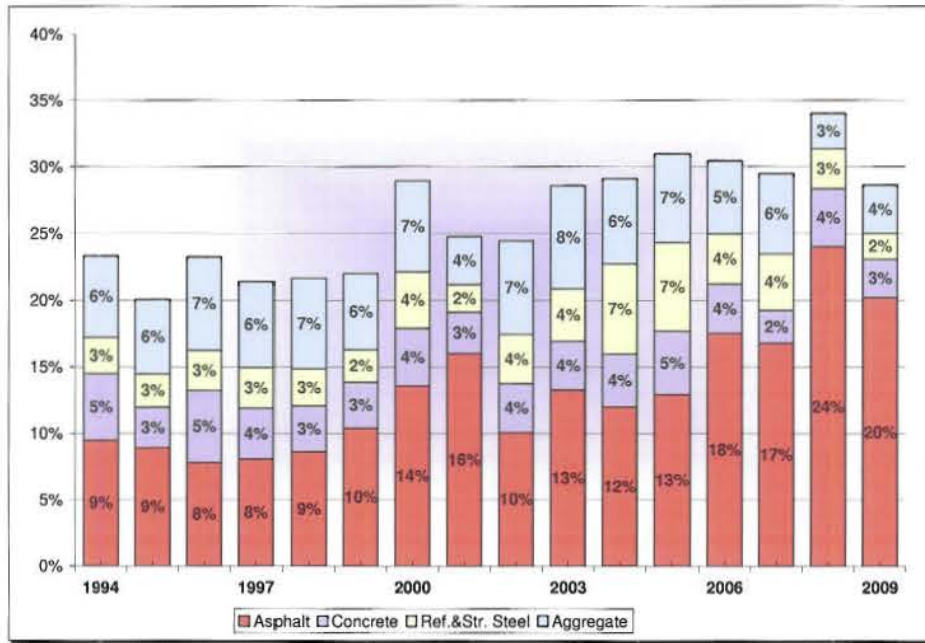
This table summarizes shifting attitudes in the supplier marketplace. It is organized as follows. As an example, using the "further industry consolidation" row of data; last year, on average, respondents indicated a zero percent likelihood of further industry consolidation during the Current year, Five year time frame and Ten year time frame. This year, respondents indicated a zero percent likelihood of further industry consolidation during the Current year, but asphalt and cement industry respondents expect a 50% likelihood of further consolidation within Five years, while steel respondents expect a 75% likelihood of consolidation within Five years, summarized as 50/50/75.

**Figure 2. Historical Florida GSP Growth**

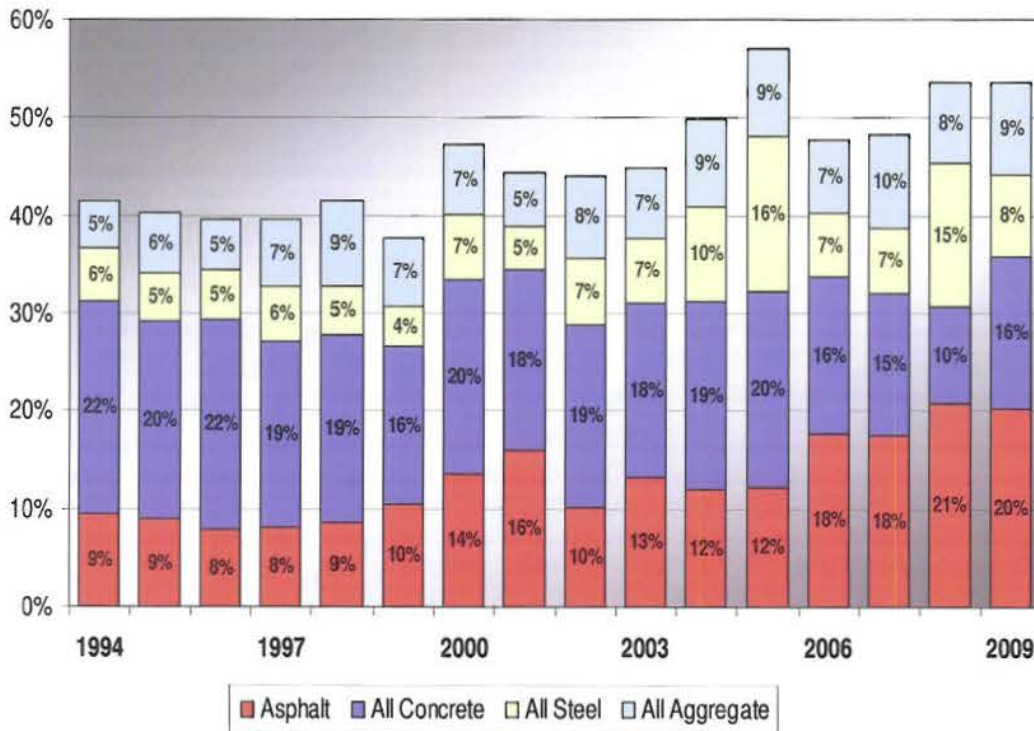


## Percent Cost Composition of Traditional Lettings by Fiscal Year

**Figure 3.** Cost Composition, using Pay Items included in Weighted Average Price Calculations



**Figure 4.** Cost Composition, using all relevant Pay Items





## Projected Materials Requirements for 5 year Work Plan

Table 1. 5 Year Estimates of Materials Requirements

	Unit	2010	2011	2012	2013	2014
<b>FDOT Work Program</b>	\$ 000s	\$ 3,266,363	\$ 1,373,847	\$ 1,370,099	\$ 1,597,001	\$1,890,870
<b>Hot Mix Asphalt</b>	1,000 TN	7,860	4,038	4,424	5,340	5,712
<b>Asphalt Binder</b>						
PG 76-22	TN	194,220	99,789	109,321	131,939	141,150
PG 67-22	TN	189,868	97,553	106,871	128,982	137,988
ARB - 5	TN	67,591	34,728	38,045	45,917	49,122
ARB - 12	TN	19,761	10,153	11,123	13,424	14,361
ARB - 20	TN	4,911	2,523	2,764	3,336	3,569
GTR	TN	6,166	3,168	3,471	4,189	4,481
<b>Concrete</b>						
Structural Concrete	CY	303,810	444,101	371,808	369,484	374,940
Ancillary Concrete**	CY	3,162,470	1,505,133	1,612,938	1,542,418	1,436,778
Total Concrete	CY	3,466,279	1,949,234	1,984,747	1,911,902	1,811,718
<b>Steel</b>						
Reinforcing Steel	TN	19,415	5,872	4,722	4,713	9,133
Structural Steel	TN	20,756	6,277	5,048	5,038	9,763
<b>Aggregate</b>						
Base Material and Other Aggregate	TN	2,125,000	987,400	615,200	512,600	1,189,000
Aggregate for Asphalt	TN	6,649,600	3,416,500	3,742,900	4,517,300	4,832,600
Aggregate for Concrete	TN	4,749,700	2,670,900	2,719,600	2,619,800	2,482,500
Total Aggregate	TN	13,524,300	7,074,800	7,077,700	7,649,700	8,504,100
<b>Bridges</b>	Number	146	39	48	38	55

\*\* Concrete Pipe, Sidewalk, Drainage Structures, etc

Source: Calculated, from data provided by FDOT Estimates Office. Projects Scheduled for Letting in later years of the Work Program are in early stages of design, and materials estimates may be understated for the last two years of the Program.

Materials Requirements are calculated in accordance with the methodology established in 2007 and outlined in the Appendix to the November 10, 2007 report and the Aggregates section of this report. Future materials requirements declined considerably from last year's report, as fewer projects are funded due to the decline in Gas Tax Revenues and the expiring Highway Transportation Funding Bill. Various versions of a new highway funding bill are being considered by Congress which, if passed, could significantly increase materials requirements for all materials in the Work Plan.

The jump in concrete requirements from previous calculations is reflective of

- a) a shift in work mix away from capacity jobs and
- b) the availability of more refined lane-mile data.

**Table 2.** Preliminary Work Mix for 5-Year Work Program (in thousands of dollars)

<b>Work Mix</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Add Lanes	\$ 603,963	\$ 102,510	\$ 87,810	\$114,327	\$ 741,891
Bike Path	27,072	14,056	4,167	3,681	4,147
Bridge Replace/New	390,364	207,519	317,820	175,584	119,824
Drainage	12,251	4,898	15,386	6,434	9,540
Guard Rail	15,942	35,900	26,804	7,438	4,394
Interchange	64,259	130,837	11,371	14,320	78,072
Intersection	24,989	11,421	6,064	1,438	-
ITS	26,510	12,597	37,442	29,891	11,867
Landscaping/Lighting	12,083	16,986	13,278	9,314	7,834
Miscellaneous	25,919	16,847	14,064	11,664	18,065
New Road	60,144	20,735	-	74,876	45,770
Other	18,602	5,629	9,807	4,771	-
Resurfacing	697,727	649,291	754,262	1,133,164	836,670
Rigid Pave	33,436	96,318	18,444	-	-
Signing/Marking	10,424	9,568	7,427	3,256	3,893
Toll Plaza	69,110	11,687	17,914	-	7,342
Traffic Ops	19,269	6,360	12,300	11,614	1,561
Widen/Resurface	35,401	25,818	24,542	-	-
3P projects	1,137,500				
<b>Total</b>	<b>\$3,266,363</b>	<b>\$1,373,847</b>	<b>\$1,370,099</b>	<b>\$1,597,001</b>	<b>\$1,890,870</b>

## Glossary of Defined Terms & Acronyms

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**ARRA** – The American Recovery and Reinvestment Act.

**BEBR** – The Bureau of Economic and Business Research at the University of Florida, which generates detailed estimates of Florida's population, income and other trends.

**Cap and Trade** – A regulatory mechanism which requires polluting facilities to acquire a permit or allowance for the amount of pollutant the facility will produce. Facilities must hold allowances adequate to cover all of the pollutant they produce. This scheme was first used to reduce acid rain, through the Clean Air Act legislation of 1990 passed by President Bush. As an incentive for reducing emissions, for each ton of sulfur dioxide reduced below the applicable emissions limit, owners of a generating unit received an emissions allowance they could use at another unit, keep for future use, or sell. EPA reports that as of 2007, total SO<sub>2</sub> emissions achieved the program's long term goal ahead of the 2010 statutory deadline, acid rain levels were estimated to have dropped by 65%, and total costs ended up being about ¼ of what was originally projected by opponents. The European Union adopted a similar program for greenhouse gases in 2005; because of this, foreign-owned firms are expected to have an advantage over U.S. firms in adapting to a cap-and-trade marketplace.

**DOR** – Florida Department of Revenue

**Elasticity** – The measure of responsiveness in a quantity of a good or service to a change in another factor. A common example using price elasticity is, if the price of chicken increases by 10%, and people buy 3% less chicken, the elasticity of chicken would be -30% (-3%/10%). In the case of materials, elasticities can be interpreted as the percentage change in the cost of a material that correlates with a percentage change in another variable. A hypothetical example might be a 10% increase in heavy construction employment triggering a 4% increase in structural steel costs, reflecting the high degree of labor involved in structural steel fabrication.

**FIRREA** – Financial Institutions Reform, Recovery and Enforcement Act of 1989, the S&L Bailout legislation. Overbuilding in the real estate sector prompted the bailout, after housing starts dropped by 44%, causing hundreds of thrifts and savings and loans to become insolvent. The legislation created the funding for RTC (Resolution Trust Corporation), to close the thrifts. In the four years following its passage, over 700 S&L's and 1600 banks failed, and the 1990-1 recession followed.

**OEDR** – The Office of Economic and Demographic Research, which produces estimates of Florida's General Revenues (Tax Revenue) for the Florida Legislature twice a year through the Revenue Estimating Conference. OEDR produces detailed projections of expected employment, income, housing, population and other trends through 2030, which can be accessed at [www.edr.state.fl.us](http://www.edr.state.fl.us).

**IEC** – The Institute of Economic Competitiveness at the University of Central Florida, which generates detailed projections of housing, employment, income and other demographic data for the State of Florida and subregions.