Construction Cost Escalation….  

_The Washington State Story_

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2006 AASHTO Subcommittee on Construction  
San Juan, Puerto Rico
Price Escalation Versus Inflation

Sticker shock: Cost estimates for highway projects skyrocket
Cost Escalation – The Background

• Trends developed in 2002 and 2003
  – Mostly steel price and availability
  – Some concern over cement
• 2004 and 2005 showed marked increases in fuel
  – Major driver for all of our items of work
  – Hot Mix Asphalt (HMA) is estimated to be 36% dependent on petroleum products
  – Cement continues to loom
• Late August 2005, Hurricane Katrina compounds the problem
  – Reduction in Refinery Capacity
  – Increase in work and demand for material, equipment and labor
• 2005 and 2006 continues to “fuel” the market
  – Crude price run up, due in part to continued “geo-political” unrest
    • $50 $60 $70 barrel crude
    • $2.00 $3.00 gallon diesel
  – Unprecedented construction program – both private and public
Timing Is Everything…
Why did WSDOT become so interested in cost escalation?

Highway Construction Program*
Dollars in Millions, 2006 Supplemental Budget

* This figure includes all Pre-Existing Funds (state and federal), Nickel and TPA funds. Includes Preservation and Improvement Programs with two exceptions: expenditures for the Tacoma Narrows Bridge and expenditures in the Improvement Program reimbursed by Sound Transit.
Development of Project Estimates

Budget is refined as project development process unfolds

- Costs change as market forces change
- Legislative expectations set
- Project cost becomes “known”
- More Variance (Project Development Risks)
- Costs change as project is defined
- Less Variance (Construction Risks)

<table>
<thead>
<tr>
<th>Early Project Definition</th>
<th>Project Engineering, Permitting and Right-of-Way</th>
<th>Ad Date</th>
<th>Construction Award Date</th>
<th>Operationally Complete</th>
</tr>
</thead>
</table>

**CEVP has been widely recognized across the country as a major step forward in project cost estimating for large infrastructure projects.**
Contracts Awarded

Highway Construction Contracts Awarded
Year-to-Year Comparison

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Number of contracts awarded</td>
<td>177</td>
<td>176</td>
<td>129</td>
<td>141</td>
<td>118</td>
</tr>
<tr>
<td>Total award amount for highway contracts</td>
<td>$250,561,516</td>
<td>$314,534,831</td>
<td>$389,592,349</td>
<td>$500,099,488</td>
<td>$361,514,031</td>
</tr>
<tr>
<td>Total engineer’s estimate for contracts</td>
<td>$277,091,361</td>
<td>$355,420,644</td>
<td>$398,923,582</td>
<td>$511,364,300</td>
<td>$345,802,068</td>
</tr>
<tr>
<td>Average % awards were above/below the estimate</td>
<td>-7.5%</td>
<td>-6.5%</td>
<td>-1.4%</td>
<td>1.3%</td>
<td>1.9%</td>
</tr>
<tr>
<td>% total award is above/below the engineer’s estimate</td>
<td>-9.5%</td>
<td>-11.5%</td>
<td>-2.3%</td>
<td>-2.2%</td>
<td>4.5%</td>
</tr>
<tr>
<td>Combined contract value awarded below the estimate</td>
<td>71.7%</td>
<td>84.0%</td>
<td>53.3%</td>
<td>74.4%</td>
<td>30.5%</td>
</tr>
<tr>
<td>Contracts awarded below the estimate</td>
<td>129</td>
<td>123</td>
<td>85</td>
<td>77</td>
<td>54</td>
</tr>
<tr>
<td>% of contracts awarded below the estimate</td>
<td>72.9%</td>
<td>69.9%</td>
<td>65.9%</td>
<td>54.6%</td>
<td>45.8%</td>
</tr>
</tbody>
</table>

*Does not include the Tacoma Narrows Bridge and the Hood Canal, Bridge Design Build Projects, or Emergency contracts.

Source: WSDOT’s Construction Office
The Construction Cost Index (CCI) helps WSDOT track market costs of a “basket” of common highway construction items that are strongly influenced by materials costs.

The following components (weighted as shown) are used to compute the CCI:
- Concrete Pavement 3.2%
- Crushed Surfacing 7.9%
- Roadway Excavation 10.7%
- Structural Concrete 17.4%
- Steel Reinforcing Bar 5.4%
- Structural Steel 6.9%
- Hot Mix Asphalt 48.5%

Data Source: Unit price history from low bids on the above construction materials collected from WSDOT bid openings.

The eleven-year average growth rate of the CCI from 1990 through 2001 was 1.5% per year. Since 2001, the average growth rate has been 12% per year.
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Prospects for Labor Costs

• Labor costs contribute roughly 40% to contract costs
• Potential labor shortages
• Contractors can face a “premium charge” just to attract a qualified workforce in a booming construction market
• Contract negotiations could see upward pressure on wages, healthcare and retirement
Consolidation of Bidders

Significant Acquisition and Consolidation Trends Affecting Pacific Northwest Market

• 1980’s Fiorito Brothers no longer bids highway work
• 1990’s Ledcor Industries no longer bids highway work
• 1994 Wilder Construction Co. acquires Construction & Rigging
• 1995 Progressive Contractors Inc. close in Washington
• 1997 Associated Sand & Gravel acquired by ARC Material Corp (currently known as Rinker Materials)
• 1998 Oldcastle Inc acquires M. A. Segale (currently known as ICON Materials)
• 1998 Atkinson Construction becomes a wholly owned subsidiary of Clark Construction Group, LLC.
• 1999 Oldcastle Inc acquires Inland Asphalt
• 2000 Granite Construction acquires Wilder Construction Co.
• 2001 Superior Asphalt acquires Morrill Asphalt
• 2001 General Construction Company becomes an affiliate of Kiewit Construction
• 2002 American Civil Constructors acquires Hurlen Construction
• 2004 Wilder Construction Co. absorbs key One Way Construction personnel
Contractor Participation

Number of Construction Firms Prequalified for Bidding On, and Winning WSDOT Construction Contracts

Number of Bidders

- Number Meeting Prequalification (no data available before 2004)
- Number Submitting One or More Bids to be Prime Contractor
- Number Winning an Award as Price Contractor

2000 2001 2002 2003 2004 2005
Specialty Areas
Subcontracting and supply

**Hot mix asphalt.** Adequate competition in most of Western Washington but only one firm now supplying the majority of the Olympic Peninsula. Much of Eastern Washington sees little or no competition.

**Roadway striping.** Only three active private firms in Washington.

**Shaft Drilling.** Six firms now seeking work on WSDOT jobs, but only two have oscillator/rotator capability. WSDOT is encouraging a Utah firm to become active in WA.

**Concrete pre-stressed structural elements.** Suppliers in Tacoma, Spokane, Yakima and Pasco. Oregon and Canadian suppliers can compete, depending on haul costs.

**Concrete post-tensioned structural elements.** Currently only two firms doing this work. A third is trying to make entry.

**Steel fabrication.** Now limited to firms in Vancouver and Portland.

**Deck Overlays – microsilica, latex, polyester.** There are primarily two firms doing this type of work.
Average Number of Bidders

The average number of contractors bidding on WSDOT projects has decreased 11% in the first two quarters of 2006, from an average of 3.5 bidders in 2005 to an average of 3.1 bidders in the first two quarters of 2006.

![Average Number of Bidders By Size of Contract](image)
Oil Prices Driving Costs Upward

Hot Mix Asphalt, Crude Oil & Diesel Fuel Indices

Crude Oil
US Dept. of Energy, Energy Information Administration, West Texas Intermediate

Diesel Fuel
US Dept. of Energy, Energy Information Administration, West Coast No. 2

Hot Mix Asphalt
WSDOT

BASE 2002 Q1 = 100
Communication

- Communication with Industry
  - AGC, ADSC, WAPA

- Media opportunities

- Communication with Elected Officials
  - Committee weekends
  - Budget Hearings

- Communication with the Governor’s Office
  - Through the Government Management and Accountability Program (GMAP)
  - Governor's Council of Economic Advisors
  - Letter to House and Senate Leadership

Things that control us    Things that we can (partially) control
Rising Construction Costs – Record National Media Coverage of Rising Highway Construction Costs and Impacts

- "WYDOT pleads for more dollars"
- "Construction costs restrict state road"
- "Construction costs rise with oil prices"
- "Price of asphalt proves crushing"
- "Soaring materials costs hit projects"
- "DOT postpones 24 projects"
- "Sticker shock hits construction projects"
- "Paving plans hit pothole in rising price of asphalt"
- "Construction costs slow transportation growth"
- "VDOT: Rise in raw material prices to cost agency additional $180 million"
- "Down the Road for I-5 Freeway"
- "Construction costs on the rise"
- "VDOT postpones 24 projects"
- "Road costs floor it in the fast lane"
- "Officials: Expect fewer projects"
- "Oil drives up asphalt tab"
- "Asphalt cost slows road work"
- "Road costs increase as petro soars"
- "East Valley highway expansion threatened"
- "The road not taken"
Things That Control Us

- Overall volume of public and private sector work seeking contractors.
- Contractors’ access to key subcontractors and sources of construction material.
- Bonding and other capacity constraints affecting contractors’ appetite for work.
- Market trends in the construction industry towards consolidation and shrinkage of number of local firms.
- Contractors’ appetite for “risk” is inversely proportional to the volume of work available.
Things That Control Us

Trailing Indicators
WSDOT prepares its construction cost estimates from the information about market conditions drawn from recent bids, not from a crystal ball of future market conditions. WSDOT accumulates construction cost information into a construction cost index and compares that information against the experience of other states. WSDOT’s Construction Cost Index is a composite of unit price information from low bids on seven of the most commonly used construction materials. These items reflect a composite cost for a completed item of work and include the cost of labor, equipment, and materials.

The first of the graphs on page 43 shows WSDOT’s experience since 1990, plotted against similar types of cost indices maintained by the Federal Highway Administration (FHWA) for the country as a whole and by the California Department of Transportation (CalTrans) for California. The second looks in greater detail at the most recent 15 quarters. FHWA has not yet released data on the two most recent quarters. WSDOT will be including Construction Cost Indices for other states in future editions.

The Crystal Ball
In the world of markets, everyone knows by heart the disclaimer in the advertisements for mutual funds, “Past results are not a guarantee of future performance.” This is precisely the case when looking ahead to national and local construction industry pricing, especially when price volatility seems inevitable from the many trends the industry now faces.

WSDOT’s construction cost estimates are necessarily based completely on available trailing indicators and there is neither data nor methodology from which engineers can estimate projects based on crystal ball forecasts of changing future prices. In the Cost Estimate Validation Process (CEVP)™, which WSDOT is applying to large projects, some account is given to baseline future inflation.

For future project costs, WSDOT applies industry standard inflation rates to base estimates in order to project year of construction costs. Recent trends indicate that tables detailing inflation rates were in need of update. The rates used on these tables were evaluated against updated industry forecasts and updated. The changes to the tables include a higher than previously forecasted inflation rate for 2004 and 2005 and an updated forecast for future years. Updating the inflation rates used to forecast future costs attempts to reflect some of the recent price trends.

Recent coverage of construction industry inflation in The Engineering News Record, the leading industry periodical, contained the following statements, none of which can be regarded at this time as more than the weather vanes of industry sentiment:

• Typical estimating is based on trailing indicators (past bid history)
• Past results are not a guarantee of future performance
• There is no crystal ball

Making information available to the public
This quarter, WSDOT began publishing its materials costs on its website. In line with the agency’s “No Surprises” philosophy, details on costs trends are now available to the public with updates occurring at the end of every quarter. To view some of the most recent costs by quarter, see the graphs on page 46. These graphs, as well as costs on an annual basis from 1990 to 2004, are available at www.wsdot.wa.gov/biz/construction/constructioncosts.htm.
We Can Update Our Trailing Indicators
WSDOT sends quarterly updates to its designers (shown below)

**Steel Reinforcing Bar:**
The unit bid price increased by $0.33 from the average unit price of $.90 per pound in the first quarter of 2006. The prices ranged from $0.85 to $2.15 per pound.

**Structural Concrete:**
$480.56 per cubic yard
The unit bid price decreased by $99.35 from the average unit price of $579.91 per cubic yard in the first quarter of 2006. The prices ranged from $385.00 to $1,100.00 per cubic yard.

**Hot Mix Asphalt:**
$57.89 per ton
The unit bid price increased by $2.93 from the average unit price of $54.96 per ton in the first quarter of 2006. The prices ranged from $43.41 to $750.00 per ton. The average unit bid price for Eastern Washington was $49.32 and for Western Washington was $62.86.
Things that We Can (Partially) Control

The “Toolbox”

Reduced cost through increased competition

Communication
• Time bid advertisements to promote competitive appetite
• Communication of current and future contract opportunities; special outreach on unusual or difficult projects
• Call bidders

Contract structure
• Bundle/break up projects to attract bidders
• Give flexibility to contractors to encourage them to shop for the most economical materials values (“performance or end product specifications”)
• Flexible start date

Owner of choice
• Provide early payment provisions (“materials on hand”)
• Cost Reduction Incentive Proposals (CRIPs)
• Fair and efficient practices in contract administration
• Fair and efficient risk allocation in the contracting relationship
• Consistency in Specifications and a fair process for responding to questions and requests for clarification

Reduced cost through reduced scope
• Bid “additive alternates”
• Adjust a project scope to “buy-less”
• Cancel a project that inflation in materials costs has made too expensive.
Questions??

http://www.wsdot.wa.gov/biz/construction
As we begin to re-run CEVPs for a few large projects, we expect that our cost estimate ranges will extend to the right to reflect cost growth and uncertainty about that growth.*

* Other factors, such as a change in scope, may also contribute to a change in cost estimate ranges.