

Cross-Cutting Management Issues

Construction Cost Trends

Trends relating to rising costs are affecting state transportation departments across the country, including WSDOT. Since 2004, the construction industry has seen prices spike for materials such as steel, asphalt, and concrete. Highway construction has been hit particularly hard, because it depends on a very limited set of materials and is vulnerable to oil price increases. Highway construction contractors use large quantities of fuel to transport materials and equipment to the worksite and to power construction equipment. These market conditions have caused transportation agencies to scale back or delay projects, or seek additional funding to deliver already planned projects.

Calculating the Construction Cost Index

WSDOT prepares construction cost estimates using historical information about market conditions drawn from recent bids. Like other state DOTs, WSDOT must extrapolate for the future based on past records. WSDOT accumulates construction cost information and calculates a Construction Cost Index (CCI), which 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 costs of labor, equipment, and materials. Once calculated, the CCI is compared to those of five other Western states. The components in the table below (are weighted as shown) are used to compute the CCI.

Construction Cost Index increases by 21.3% in the first half of 2008

The graph above illustrates the past 18 years of CCI data for Washington state. This is plotted against the CCI of the Federal Highway Administration, and a line representing the combined CCIs of five other western states; California, Colorado, Oregon, South Dakota and Utah.

The average annual growth rate of the CCI held steady at about 1.5% per year from 1990 through 2001. Beginning in 2002 and continuing through 2005, the growth rate increased to 8% per

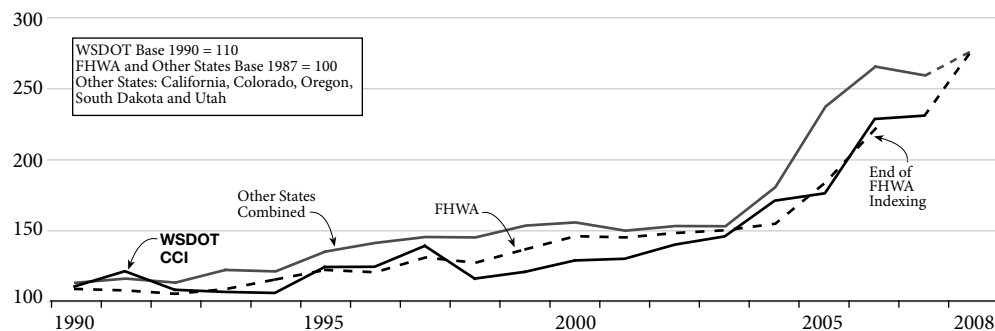
Components that make up WSDOT's CCI By material and corresponding percentage

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|--------------------|-------|-----------------------|-------|
| Hot mix asphalt | 48.5% | Structural concrete | 17.4% |
| Roadway excavation | 10.7% | Crushed surfacing | 7.9% |
| Structural steel | 6.9% | Steel reinforcing bar | 5.4% |
| Concrete pavement | 3.2% | | |

Data Source: WSDOT Construction Office.

Construction Cost Indices for Washington State, FHWA, and selected western states

1990 - 2008 (through June 2008)



Data Source: WSDOT Construction Office.

Note: WSDOT 2008 index is for quarters 1 and 2, The FHWA Index was discontinued in 2007, Other states 2008 data includes California, Colorado, Oregon, South Dakota and Utah annual indices.

Note: 2003 and 2004 WSDOT CCI data points adjusted to correct for spiking bid prices on structural steel.

Construction Cost Trends Performance Highlights

WSDOT's Construction Cost Index (CCI) has risen 21.3% in the first two quarters of 2008.

From 2002-2007, WSDOT's CCI grew 65.5%, slightly less than five comparable western state's CCIs, which averaged 69.3% in the same period.

The average number of bidders for WSDOT projects is increasing: 72.3% of projects in the first two quarters received three or more bidders.

Crude oil prices are up 91% over last year's reported prices. Asphalt binder prices are up 60% in western Washington and 79% in eastern Washington.

WSDOT continues to use materials escalation clauses in contracts to increase competitive bidding: \$1.5 million has been paid out for 25 contracts where prices escalated beyond 10% of the original bid prices.

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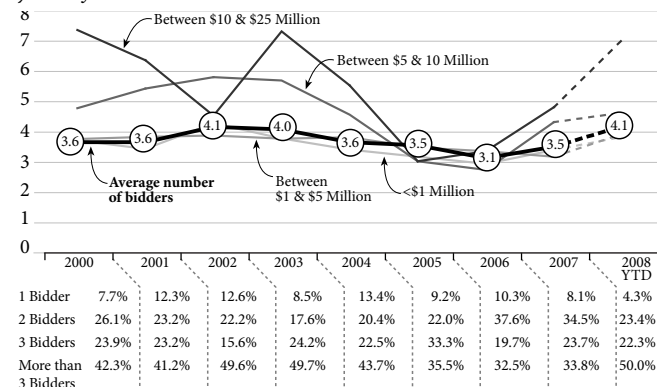
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year. In 2006 and 2007, WSDOT's CCI increased by 31%. The rapid growth of the CCI has continued into 2008. The CCI has experienced a 21.3% increase in the first two quarters of 2008 over the annual average for 2007, from 230 to 279.

WSDOT's CCI mirrors the experiences of the other five Western states' The CCI average for the five other states increased 69.3%. Between 2002 and 2007, while WSDOT's CCI increased 65.5%.

Average number of bidders

By size of contract



Data Source: WSDOT Construction Office.

More contractors bid on projects in 2008

WSDOT's goal is to have three or more bidders for each highway construction project. From 2003 to 2006, fewer contractors submitted bids for WSDOT projects, as large public and private construction programs in Washington State, as well as at the national level, kept contractors busy with a full workload.

During the last half of 2007, the average number of contractors bidding on each WSDOT project began improving. WSDOT's average number of bidders increased from 3.10 in 2006, to 3.48 in 2007, increasing to 4.15 in the first half of 2008. The number of contracts with three or more bidders also increased during the first half of 2008 to 72.3% of all contracts. In 2007, 57.4% of contracts had three or more bidders.

The size of WSDOT's construction program has increased as both the 2003 Nickel and 2005 Transportation Partnership Account construction programs have matured and developed. In 2005 and 2006, it was difficult to find enough contractors to work on WSDOT projects during a time when other building programs were competing for the same workforce. The recent increase in competition may produce more favorable bids for

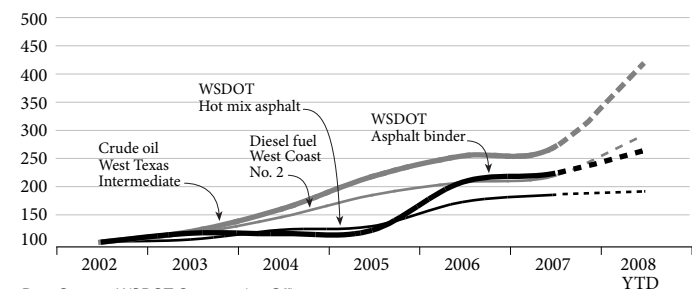
WSDOT projects, which is fortunate from a fiscal standpoint. Although material costs have increased significantly during the first half of 2008, contractors needing to secure work were not able to pass along the full increase in their bids.

Oil prices increases cause further construction cost inflation

Crude oil prices have a large impact on the cost of WSDOT projects. Crude oil prices tracked by WSDOT have increased 91% in past year, from an average of \$65 a barrel in the second quarter of 2007 to an average of \$124 a barrel during the second quarter of 2008. Considering that essential materials such as fuel and asphalt are obtained from crude oil are required to complete many activities on a construction project, a 91% increase in the cost of this input can translate to a substantial increase in the cost to construct a WSDOT project.

WSDOT asphalt, crude oil, & diesel fuel indices

2002-2008 (year-to-date)



Data Source: WSDOT Construction Office.

Note: Base in 2002 = 100. Diesel and crude indices compiled by the U.S. Dept. of Energy, Energy Information Administration.

From the fuel that runs equipment and transports materials to the job site, to its use as an asphalt binder in pavement, the prices of crude oil (and ultimately the price of these refined products) account for a significant portion of the final project costs.

The relationship between Hot Mix Asphalt (HMA) and crude oil prices is especially significant, as virtually every activity necessary to produce and place a ton of HMA is highly dependant on petroleum products. Mining, crushing, hauling, stockpiling, and drying the aggregates all require fuel. Liquid asphalt used as a binder for HMA is derived from crude oil. Finally, the hauling of the mix to the site, and the equipment needed to place and compact the asphalt, requires petroleum products as well.

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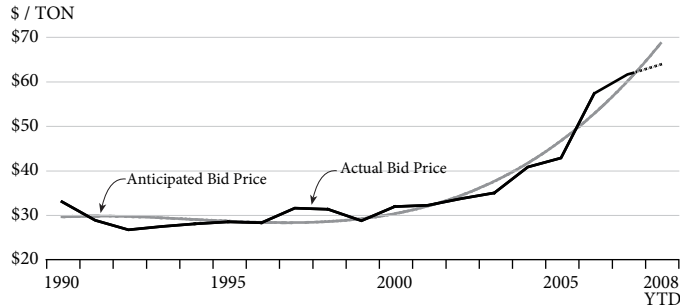
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Hot Mix Asphalt prices typically follow a similar pattern to the price of crude oil and diesel fuel. The cost of asphalt binder, the sticky substance in asphalt that is a residual of crude oil has skyrocketed during 2008. Fortunately, WSDOT solicited bids for most of this year's paving projects before this price increase occurred. Due to good bid timing, the average price bid by contractors for HMA increased just 3.4% during the first half of 2008 over the annual average for 2007. WSDOT expects the full increase to be realized in the CCI a year from now.

WSDOT tracks the cost of the asphalt binder used to produce HMA and calculates a monthly index of asphalt binder prices, for both the east side and the west side of the state. According to WSDOT's index, the price of asphalt binder has increased 60% on the west side of the state and 76% on the east side of the state during 2008. Asphalt binder accounts for roughly half the cost of a ton of HMA, so when prices for asphalt binder go up as they have so far this year, the price of HMA follows.

Hot mix asphalt unit bid price

1990-2008 (through June 2008)



Data Source: WSDOT Construction Office.

Asphalt supply issues affect Washington state marketplace

In addition to recent cost increases for liquid asphalt, WSDOT has also been hit by a shortage of liquid asphalt. Due to price increases for crude oil, refiners that do not extract their own crude oil are finding it increasingly difficult to make a profit. In an attempt to make refining more profitable, many of these companies are switching to refining lighter types of crude oil. These lighter crude oils produce more high-end products like gasoline and diesel fuel, but less residuals like asphalt.

HMA and fuel escalation clauses

On each construction contract, WSDOT pays an amount for each ton of HMA that the contractor specified when they originally bid the work. This unit bid price includes labor, equipment and the material. Because contractors must bid the unit price months and sometimes years before they will place HMA on a WSDOT project, contractors are at risk of underbidding the cost of HMA during times when price increases significant, as they are now. In the past, contractors would build the risk of future price increases into their unit bid, but the extent of recent price increases means it is no longer cost effective for contractors to do so for all construction materials. This is why WSDOT has introduced escalation clauses for HMA and fuel and is considering expanding the use of such clauses.

WSDOT escalation payments increase

WSDOT is using fuel and asphalt escalation clauses on select multi-year contracts. The clauses allow for a correction in price on applicable items when fuel or asphalt binder experience significant increases or decreases in cost. This protects contractors from volatile fuel and asphalt prices. It also encourages them to submit bids for projects that are based on current market conditions, rather than potential future conditions, resulting in a cost savings for WSDOT when those increases do not occur.

At the end of July, 24 contracts contain the fuel cost escalation clause. WSDOT has paid a total of \$1 million on 15 of those contracts. No payments have been made to date on the remaining nine contracts. During the same time, WSDOT paid a total of \$500,000 on 10 contracts containing the asphalt cost adjustment. An additional 22 contracts containing the asphalt adjustment have made no payments to date.

New escalation clauses now under development

Due to current price volatility, WSDOT has been asked by the construction industry to considering expanding the use of cost adjustment clauses. In July, WSDOT developed a clause similar to the asphalt and fuel cost adjustments that would address steel prices. WSDOT is also studying the effects of expanding the use of the asphalt clause to shorter duration construction contracts or lowering the threshold that would make the clause take effect (currently prices must change more than 10% for an adjustment to be made). Further evaluation of the expanded use of this clause is needed before the agency takes action.