

Cost Control Texas

Joint Conference on Cost Savings Methods
St. Louis Missouri

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Texas Department of Transportation

Topics

- **Highway Cost Index (HCI) and Buying Power**
- **National Perspective**
- **Cost Control Task Force Results**
 - **Maintenance (Pavements)**
 - **Pavement Design and Alternates for Pavement Design**
 - **Alternative Materials, Material Allowances, and Requirements**
 - **Structures and Structure Aesthetics**
 - **Roadside Maintenance and Landscaping**
 - **Markings**
 - **Competition**
 - **Project Scope**
 - **Other**
- **Summary**



HCI (97 Base) Buying Power

1 Month

Index (% Increase)

July 03 121.9

(12%)

July 04 136.6

(22%)

July 05 167.0

(78%)

(28%)

July 06 214.9

12 Month

Index (% Increase)

118.3

(6%)

125.6

(23%)

148.9

(51%)

(27%)

189.6

Washington State Construction Cost Escalation

- ◆ Communication
- ◆ Contract Structure
- ◆ Owner of Choice
- ◆ Reduced Scope

Things that WSDOT 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 or 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 (not preferred)

Things that WSDOT Cannot Control The "Crystal Ball"

There is no crystal ball. 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 cannot influence:

- 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

TxDOT Administration Direction

- ◆ Task Force Established Amadeo Saenz
AED EO Memo of August 2006
- ◆ Task Force Meeting
- ◆ Meeting with Industry
- ◆ Report October 2006
- ◆ Implementation Responses
February 2007



MEMORANDUM

TO: District Engineers
Division Directors
Office Directors

DATE: August 23, 2006

FROM: Amadeo Saenz, Jr., P.E. 

SUBJECT: Cost Control Task Force

The cost to maintain the transportation system has seen significant increases in the past two years. Referring to the department's Highway Cost Index publication on the web at http://tp.dot.state.tx.us/pub/txdot-info/cst/july06_hci_binder.pdf, the department has seen an increase in cost for work of 28 percent in the past year and over 50 percent in the past two years. These increases will have a dramatic impact on the department's ability to reduce congestion and maintain the system.

To address these increases, districts will need to carefully evaluate their work priorities, project design, and contract requirements to see that we deliver the desired level of service. To assist in those efforts, I am establishing the Cost Control Task Force, members as follows:

Cost Control Task Force

Thomas R. Bohuslav, P.E., Chair, CST	Joe Anderson, P.E., WFS
Joe Graff, P.E., MNT	David Kopp, P.E., SAT
Tom Beeman, P.E., DES	Bob Appleton, P.E., BRY
Darren Hazlett, P.E., CST	Robert Stuard, P.E., AUS
Carol Rawson, P.E., TRF	Ted Moore, P.E., LBB
Keith Ramsey, P.E., BRG	Paul Montgomery, P.E., LFK

Their task will be to develop recommendations the department can use to reduce cost. Examples of issues to be considered are:

- cost effective preservation strategies (e.g. a two-inch overlay design could be changed to spot levelup with a seal coat, seal coat aggregate size, eliminating sealing shoulders, etc.),
- project scoping including the use of additive alternates, aesthetics, and special features,

Cost Control Report

50 Basic Ideas

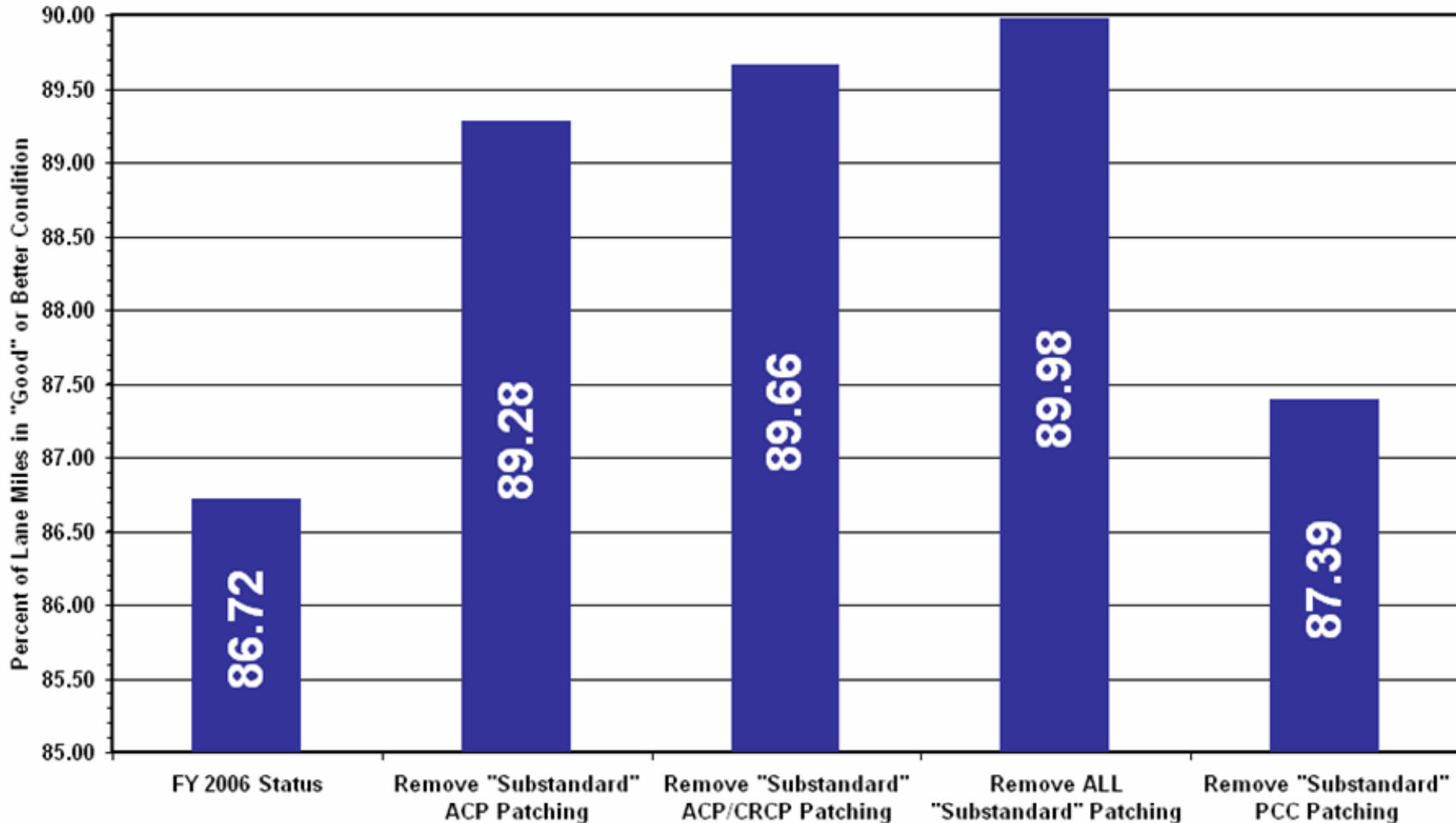
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- **Other**

Cost Control Ideas

Maintenance (Pavements)

Idea	Potential Cost Savings	Best Application
1. Don't seal shoulders every cycle.	We currently maintain 446,898,768 SY of flexible pavement shoulders. Cost savings potential could be as high as \$50,000,000 a year.	Lower volume roads
2. Use spot levelup with seals or microsurface on lower volume roads.	Assuming 10% of the lane miles overlaid were low volume, savings could be as high as \$22,000,000 a year.	All roads less than 1000 ADT should be treated this way.
3. Spot and strip seal main lanes and shoulders.	In FY 2006, we seal coated 22,217 LM where 781 LM of that was spot and strip. Assuming that if you use spot and strip seal (30 percent of the lane width) for 10 percent of the roads that you would normally seal full width, the potential savings could be as high as \$17,500,000 a year.	Lower volume roads.

Effect of Patching on Statewide Pavement Condition Goal



Cost Control Ideas

Maintenance (Pavements)

Idea	Potential Cost Savings	Best Application
<p>5. Use fog seals on main lanes and shoulders.</p>	<p><i>See following spreadsheet showing cost per SY for different asphalts and seals.</i></p>	<p>This would only be good on very low volume roads.</p>
<p>6. Engineer the seal coat. Select the appropriate asphalt, aggregate, and precoat requirements. Consider reduced requirements for underseals.</p>		<p>Seal Coats should be “engineered” using appropriate asphalts and aggregates depending upon traffic, placement location, area of the state, time of the year etc.</p>

Cost Control Ideas

Maintenance (Pavements)

Typical Materials and Costs
Item 316 Cost per Square Yard

Aggregate	Binder				
	AC-20-5TR	AC-15P	AC-20XP	CHFRS-2P	CRS-2P
P 3S SAC-B	\$1.94	\$1.84	\$1.83	\$2.23	\$2.17
3S SAC-B	\$1.77	\$1.68	\$1.67	\$2.07	\$2.00
3 SAC-A	\$1.57	\$1.47	\$1.47	\$1.72	\$1.67
3 SAC-B	\$1.50	\$1.41	\$1.40	\$1.65	\$1.60
4 SAC-A	\$1.47	\$1.37	\$1.36	\$1.55	\$1.51
4 SAC-B	\$1.14	\$1.04	\$1.04	\$1.22	\$1.19
5 SAC-B	\$0.89	\$0.80	\$0.79	\$0.89	\$0.87

Assumptions:

1. Same road conditions.
2. Emulsion allows 10% reduction in percent residue.
3. AC-20-5TR uses a higher application rate.
4. Yellow highlight shows for precoat vs non-precoat for Grade 3S case.
5. Not shown here is that when binders are bid with alternates, the price is lower.

Cost Control Ideas

Pavement Design and Alternates for Pavement Design

Idea	Potential Cost Savings	Best Application
<p>8a. Ultra Thin Bonded Wearing Course (Novachip) versus an underseal with PFC.</p> <p>b. Hot in Place Recycling with virgin material overlay in same pass (Cutler) versus Dustrol followed by an overlay versus mill and overlay with 30% RAP.</p> <p>c. Thin Bonded PFC versus an underseal with PFC.</p>	<p>a. Districts noted from contractor comments that even though the UTBWC was low when applying lane rental, prices for both dropped.</p> <p>b. Creates competition for the one pass (Cutler) process.</p> <p>c. Creates competition.</p>	<p>a. UTBWC is generally used in high volume areas, areas where lane rental provisions will affect prices.</p> <p>b. The one pass process reduces driver delay and additional striping. Applying lane rental is effective in higher volume areas.</p> <p>c. High traffic volume areas.</p>
<p>Contractors comments on 8: Unique designs and sole source or limited sources reduces competition.</p>		

Cost Control Ideas

Pavement Design and Alternates for Pavement Design

Idea	Potential Cost Savings	Best Application
<p>8e. Concrete pavement versus flexible pavement.</p> <p>f. Lime, lime-fly ash, cement, ASB and combinations thereof options.</p> <p>i. Type A alternate Type B with lime Flex Base.</p>	<p>e. Bell County project over flexible was \$11 to \$16 M Higher.</p> <p>f. <i>HMA-Cmt Stab Base-Lime Treated Sub: Relative cost = 1.00</i></p> <p><i>HMA-Lime Stab Base-Lime Treated Sub: Relative cost = 1.45</i></p> <p><i>HMA-Lime-FA Stab Base-Lime Treated Sub: Relative cost = 1.42</i></p> <p>HMA-ASB-Lime Treated Sub: Relative cost = 1.15</p> <p><i>HMA-ASB-Flex Base-Lime Treated Sub: Relative cost = 1.19</i></p> <p>i. Yoakum district has seen some projects save as much as 22% over Type A.</p>	<p>e. High traffic volume areas.</p> <p>f. Appropriate areas for design.</p> <p>i. Where there is limited material competition.</p>
<p>Contractors comments on 8: Unique designs and sole source or limited sources reduces competition.</p>		

Cost Control Ideas

Pavement Design and Alternates for Pavement Design

Idea	Potential Cost Savings	Best Application
<p>9. Use RAP and crushed concrete for construction.</p>	<p>Blended RAP can save \$6 per ton. For a large urban district, recycled concrete can save \$1.5M per year.</p>	<p>Houston uses cement stabilized RAP for nonerodable founding.</p>
<p>12. Consider flex base with 2 course surface treatment (CST) as an option to flex base with ACP.</p>	<p><i>Strong subgrade (West Texas shallow bedrock)</i> cost/lane mile</p> <p>3" HMA-12" flex base: \$295,680 2 CST-17" base: \$230,050 relative cost ratio: 0.78</p> <p><i>Weak subgrade (East Texas, deep bedrock)</i></p> <p>7" HMA-12" flex base lime treated subgrade: \$539,200 2 CST 25" base lime treated subgrade \$360,740 relative cost ratio: 0.69</p>	<p>2 CSTs, on good flex bases, have performed well, sometimes better than base and ACP. West Texas has several sections of IH that were originally constructed with 2 CST</p>

Contractors comments: Fully support. RAP is also good for backfilling shoulders.

Cost Control Ideas

Alternative Materials, Material Allowances, and Requirements

Idea	Potential Cost Savings	Best Application
<p>17. Provide for alternative materials and construction methods in PS&E. a. Provide AEP, PCE, EAP&T, or emulsions as an option to MC-30</p>	<p>MC-30=\$2.86 AEP=\$1.92 PCE= \$1.5/gal.</p>	<p>Non-attainment areas and areas where MC-30 is not always readily available locally. Where there is limited competition for a certain type of material.</p>
<p>18. Allow for Class 5 or Class 8 for concrete joint seal. Used for joint sealer for concrete pavement or bridge joint sealant.</p>	<p>That for similar size projects specifying Class 8 cost \$1.63/lf and Class 5 cost \$2.25/lf.</p>	<p>Class 8 is for concrete only and Class 5 is for either. Class 5 has effectively one source. Both will perform for concrete.</p>

Contractors comments: Allow a wide variety of materials and products.

Cost Control Ideas

Structures and Structure Aesthetics

Idea	Potential Cost Savings	Best Application
<p>19. MSE walls in cut sections. Use Soil nail, rock nail, drilled shaft, soldier wall. Reduces the number of walls needed.</p>	<p>Can double the cost of the wall.</p>	<p>For walls in cut sections.</p>
<p>20. Aesthetics and Bridges a. Example of steel traps versus I-beams. b. Minimize wall panel unique designs. Repetition. f. Address consultant designs</p>	<p>a. Could have saved \$2 M on one project and traps would have required fracture critical BRINSAP inspections</p>	

Contractors comments: Standardize bridge design elements. Design for a whole corridor. Standardize forms and form liners. Contractors can reduce costs if they know they can reuse forms and form liners and bid more projects in an area. Reduce complexity and unique designs to save money. Contractors stated the concrete bid price can increase from \$25 per yard to double if the forms are not reused. Repetitive elements decrease costs. Also affects schedule.

Cost Control Ideas

Competition

Idea	Potential Cost Savings	Best Application
<p>31. Use delayed time start and flexible start date provisions.</p>	<p>Where there is limited competition or where significant ramp up is needed</p>	
<p>32. Give more time for Contractor's plan review prior to letting.</p>		
<p>33. Create an open air and welcome bidders. Call contractors and invite bidding, determine if there are issues with the contract that create barriers (risk) to bidding. Be available for showing jobs. For unique work, such as special forms, discuss future projects.</p>		

Contractors comments: Allow contractors to flex schedule and they can bid more projects. Months are used for design, but contractors get 2 weeks to figure costs. Call contractors. Give a timely response to questions. In TCP, short work hours mean increased cost. Costs are reduced if they know they will be able to reuse forms and liners.

Cost Control Ideas

Competition

Idea	Potential Cost Savings	Best Application
<p>34. Consider waiving prequalification on construction projects.</p>	<p>Where there is limited competition or where significant ramp up is needed.</p>	<p>Outside of (prequalification is waived automatically for construction projects less than \$300,000 and all RMCs.)</p>
<p>37. Use additive and deductive alternates. Must base award on base bid or predetermined budget amount.</p>	<p>Helps getting a project awarded and staying on budget. Especially helps when we have third party funding.</p>	<p>Consider when third party funds are included in projects or other projects where project budget has a more than normal impact on the award decision.</p>
<p>41. Update estimates. Use addendum to address barriers to bidding.</p>		
<p>Contractors comments: No indexes. Contractors may not bid a project inadequate time. Contractors do not bid when their preliminary estimates far exceed the Engineers estimate. .</p>		

Cost Control Ideas

Competition

Idea	Potential Cost Savings	Best Application
<p>39. Consider project size to increase competition. Economy of scale, bundling or splitting projects. Area contractor capacity. Consider material source influences on competition. Consider subcontractor cost when bundling so odd work is not included.</p>	<p>In a previous review competition, generally across the state we saw an average number of bidders as follows: Less than \$10 M – 3 bids. \$10 M to 150 M – 5 bids. Greater than \$150 M – 1.5 bids.</p>	<p>Know your contractors bidding capacity or limits of work volume. Discuss the size that they can bid and set at an amount that you can get good competition.</p>
<p>42. Quality of plans and information needed by contractors including available materials, yard, water, and base sources. Use photographs.</p>	<p>Contractors bid on projects with the best information available. If substantial field investigation is necessary or the contract is unclear contractors bid higher to cover to manage their risk.</p>	
<p>Contractors comments: Review consultant plans. Consultants tend to over design and not consider construction cost.</p>		

Summary

- **LCC and future cost are still important.**
- **Consider statewide perspective.**
- **Economically engineer each project and component.**