



INFLATION AT BID ITEM LEVEL & ASSOCIATED CHALLENGES

2025 VTCA / VDOT Cost Estimation Summit

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Inflation at Bid Item Level - Overview

Multiple Views of Inflation

- **The News**
- **Industry Publications**
- **FHWA National Highway Construction Cost Index**

Inflation vs Escalation

Bid Item Focus on Inflation

- **Limitations and Challenges**
- **Measured Cost Increase “Inflation” on Selected Bid Items**

Application to VDOT’s Project Cost Estimates

The News – Abundance of Information on Inflation

 CNN

Inflation is easing, but another alarm bell is ringing about the US economy

The Federal Reserve's preferred inflation gauge cooled as expected in January; however, the good news came with another potential red flag...

5 days ago



 CNN

The state of the US economy, in 9 charts

President Donald Trump on Tuesday will address Congress for the first time in his second term, and he'll do with an economy that's...

1 day ago



 CNN

US inflation heats up to 3% for first time since June

Consumer prices rose 0.5% from December – the fastest pace since August 2023 – resulting in an annual inflation rate of 3% for the 12 months...

3 weeks ago



Google Search: "Latest Inflation News from CNN" 3-5-2025

Publication – Geared Toward Our Industry

CONSTRUCTION ECONOMICS

ENR's 20-city average cost indexes, wages and materials prices.
Historical data for ENR's 20 cities can be found at [ENR.com/economics](https://www.enr.com/economics)

Construction Cost Index

+1.9%
MAR. 2025

ANNUAL INFLATION RATE

1913=100	INDEX VALUE	MONTH	YEAR
CONSTRUCTION COST	13782.50	+0.1%	+1.9%
COMMON LABOR	26152.89	+0.6%	+2.9%
WAGE \$/HR.	49.69	+0.6%	+2.9%

The Construction Cost Index's annual escalation rose 1.9%, while the monthly component increased 0.1%.

Building Cost Index

+1.8%
MAR. 2025

ANNUAL INFLATION RATE

1913=100	INDEX VALUE	MONTH	YEAR
BUILDING COST	8437.01	0.0%	+1.8%
SKILLED LABOR	12108.92	+0.9%	+3.7%
WAGE \$/HR.	67.20	+0.9%	+3.7%

The Building Cost Index was up 1.8% on an annual basis, while the monthly component showed no change.

Materials Cost Index

-1.1%
MAR. 2025

MONTHLY INFLATION RATE

1913=100	INDEX VALUE	MONTH	YEAR
MATERIALS COST	6200.65	-1.1%	-0.8%
CEMENT \$/TON	273.83	-0.1%	+15.2%
STEEL \$/CWT	117.66	+3.4%	+12.1%
LUMBER \$/MBF	778.63	-6.3%	-24.2%

The Materials Cost Index fell 1.1%, while the annual escalation rate decreased 0.8%.

Source: Engineering News Records – Construction Economics March 3, 2025

National Highway Construction Cost Index (NHCCI)

US Department of
Transportation
Federal Highway Administration
NHCCI:

2020 Q2 NHCCI: 1.96

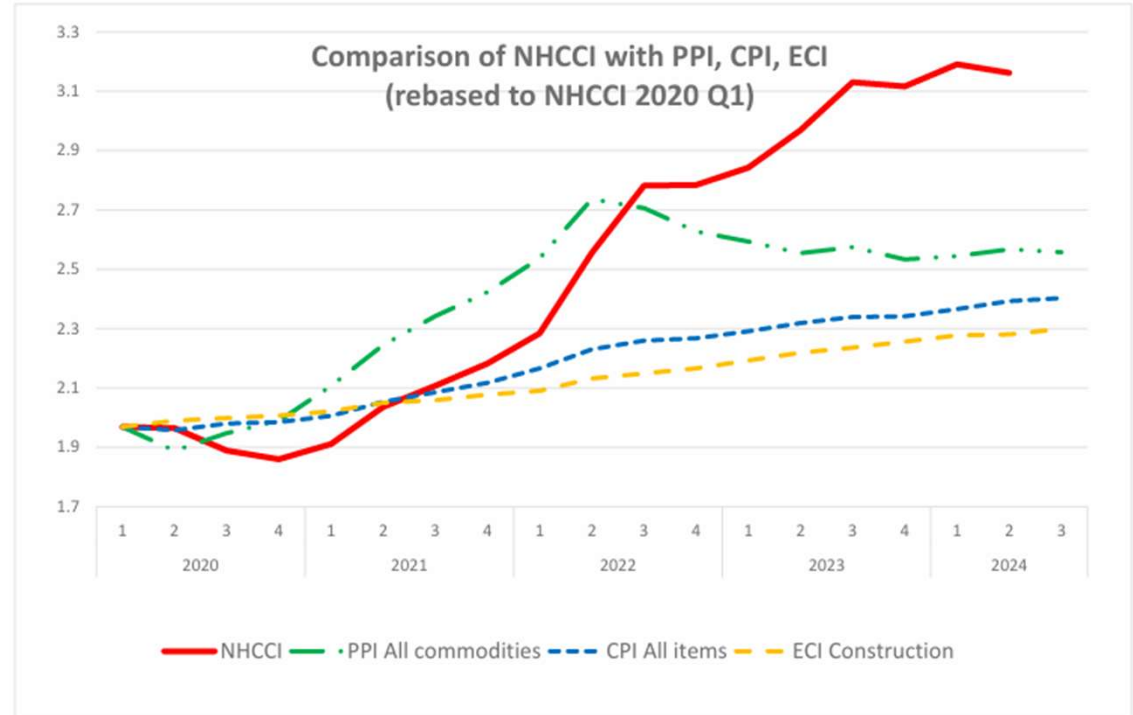
2024 Q2 NHCCI: 3.16

61% Increase

Average Increase: 15%

Annually**

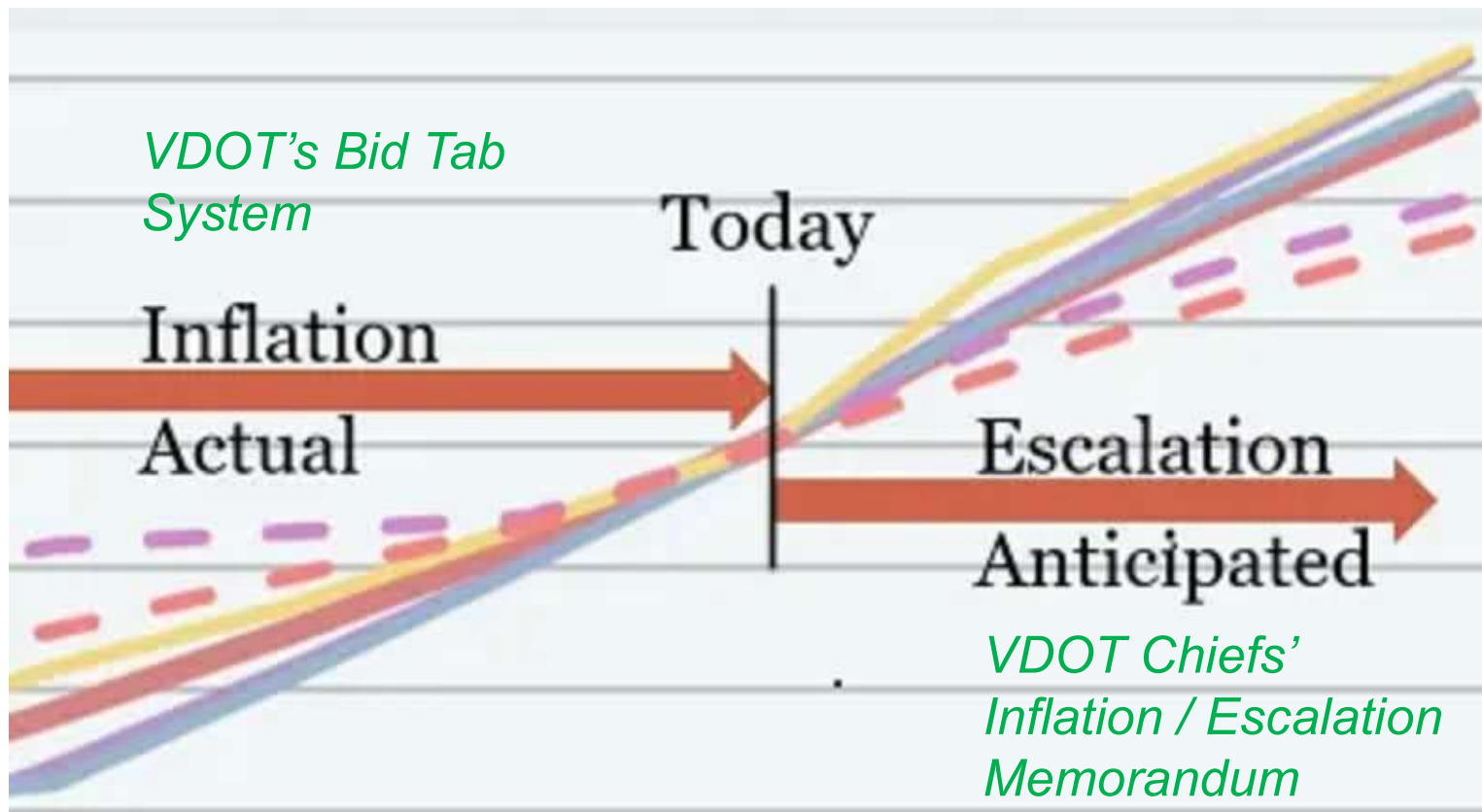
** Rounded linear growth rate



Sources: NHCCI: FHWA, Office of Transportation Policy Studies, National Highway Construction Cost Index (NHCCI) 2024 Q2 Estimates. CPI and PPI Indexes: BLS, Consumer Price Index, and Producer Price Indexes, available at <https://www.bls.gov>.

NHCCI Analysis and Narrative 2024 Q2 December 6, 2024

Inflation vs Escalation



Source of Image: Construction Analytics – Economics Behind the Headlines

Industry and Fed Data: Global – VDOT Data: Specific

Industry & FHWA
Data on Inflation



VDOT's Actual
Cost
Data



VDOT Bid Item Level Focus on Inflation – The Data

What Data?

VDOT Bid Tabulations: Received from contractors submitting on Design-Bid-Build projects, every month.

Where is the Data and how do I get it?

<https://www.vdot.virginia.gov/doing-business/technical-guidance-and-support/construction/items-codes/>

<https://www.vdot.virginia.gov/doing-business/business-opportunities/highway-contractors/bidding/>

Tabulation of Bids

Contract ID: CM125PMP125089		Counties: WISE				
Letting Date: January 22, 2025		District(s): BRISTOL / WISE				
Call Order: 144		Project(s): PM1P-961-F25,N501, PM01(352);				
Contract Time: 11/21/25 COMPLETION DATE		Min:	Max:			
Contract Description: SGR - 2025 PLANT MIX - PRIMARY						
Line No /Item ID Item Description	Alt Set /Alt Member	Quantity and Units	(1) BIZZACK CONSTRUCTION, LLC		(2) W-L CONSTRUCTION & PAVING, INC.	
			Unit Price	Ext Amount	Unit Price	Ext Amount
SECTION: 0001		REGULAR BID ITEMS	Cat Alt Set:		Cat Alt Member:	
0010	310SD20-0001	8,970.000	1.00000	8,970.00	1.00000	8,970.00
	TACK COAT	GAL				
0020	315SD20-0015	8,000.000	1.60000	12,800.00	1.13000	9,040.00
	RUMBLE STRIP CYLINDRICAL ASPHALT	LF				
0030	315SD20-0036	5,911.010	130.00000	768,431.30	147.82000	873,765.50
	ASPH. CONC. TY. SM-12.5E MAINT	TON				
0040	315SD20-0044	4,172.140	110.00000	458,935.40	122.76000	512,171.91
	ASPH. CONC. TY. IM-19.0E MAINT	TON				
0050	512SD20-0027	350.000	70.00000	24,500.00	42.21000	14,773.50
	FLAGGER SERVICE	HR				
0060	512SD20-0046	14,240.000	0.17000	2,420.80	0.18000	2,563.20
	TEMP. PVMT MRKG TY. A, 4"	LF				
0070	512SD20-0047	61,200.000	0.19000	11,628.00	0.21000	12,852.00
	TEMP. PVMT MRKG TY. A, 6"	LF				

VDOT Bid Item Level Focus on Inflation – Tools

VDOT Statewide Bid Tab System

The screenshot shows the VDOT Statewide Bid Tab Query interface. At the top, it says "Virginia Department of Transportation" and "An official website of the Commonwealth of Virginia Here's how you know". Below that is a blue header with "VDOT | Statewide Bid Tab Query". The main area contains several search filters: "Item Code" (text input), "District" (dropdown), "City/Town/County" (dropdown), "Quantity between" (two text inputs with an ampersand), "Contract let between" (two text inputs with an ampersand), "Apply Inflation" (checkbox), "Order Number" (text input), "Contract totals between" (two text inputs with dollar signs and an ampersand), "Highway System" (dropdown), "Custom Additions" (dropdown), and "Exclude High & Low Bids from Stats" (checkbox). At the bottom are "Submit", "Clear", and "Show Query Criteria" buttons.

Microsoft Excel



AASHTOWare Project Estimation



infotech Bid Express

Bidx.com

Bid Item Focus – Major Limitations and Challenges

Data Quantity:
Major
Challenge
1 of 3

- **P3 Projects (Bid tab data not available).**
- **Design-Build Projects (Bid tab data not available).**
- **Locality Advertised Projects (Bid tab data not available).**

Limitations and Challenges – Data Quantity

Item Code	Description	Calendar Year 2024 Bids Received <small>(Bid Tab Query System)</small>	Calendar Year 2024 Total Quantity <small>(Bid Tab Query System)</small>	Unit of Measure
303SD20-0001	REGULAR EXCAVATION	165	2,116,710	CY
302SD20-0081	60" CONC. PIPE	10	3,162	LF
700SD20-0098	Mast Arm 30'	11	13	EA
302SD20-0093	72" CONC. PIPE	0	0	0
803SD20-0010	CCTV Camera Pole 60'	2	14	EA

Random Sample of VDOT Item Codes and Data Received in Calendar Year 2024

Limitations and Challenges – Data Quality

Data Quality: Major Challenge 2 of 3

- **Token prices submitted by industry (i.e. \$0.01 / Unit).**
- **Limited attributes on unit prices (Complex vs non-complex nightwork vs daywork, greenfield vs urban).**

Limitations and Challenges – Similarities of Operation

Storm Drainage – Concrete Pipe (LF)

Unobstructed Open Cut vs Confined Trench Box Operation

Day Installation vs Night Installation

In Traffic, Multiple Phases vs Open Cut in “Greenfield” Location (i.e. Project Complexity)

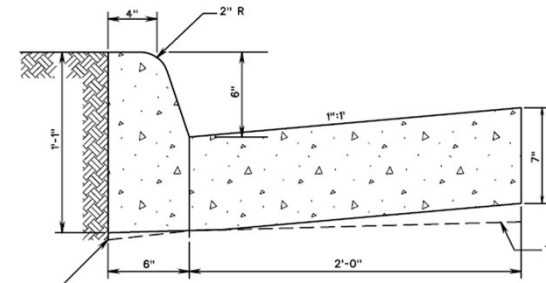
VDOT’s Bid Tab Data Lacks Key Attributes! There is an Opportunity for AI to Help



Example: Difficult, Low Production, High Unit Cost, Pipe Installation

Limitations and Challenges – Similarities of Operation

Concrete Curb & Gutter (LF) – Item Somewhat Consistent



**Regular Excavation (CY) -
“Unclassified” Item Inconsistent (Every
Project Unique)**

**Rock in Bristol District vs Sand in the
Hampton Roads District**



Limitations and Challenges – Data Consistency

**Data
Consistency:
Major
Challenge**

3 of 3

- **Approximately 3,500 Pay Item / Bid Item Codes.**
- **Vast Number of Non-Standard (NS) Item Codes.**
- **New Item Codes vs Old Item Codes – Cross Walk.**

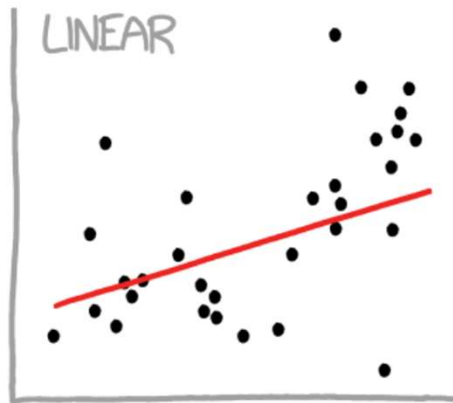
Limitations and Challenges – Data Analysis (Statistics)

Bid Tab Data Can Be “Sliced and Diced” Many Ways--- Results Can and Do Vary Greatly Depending On:

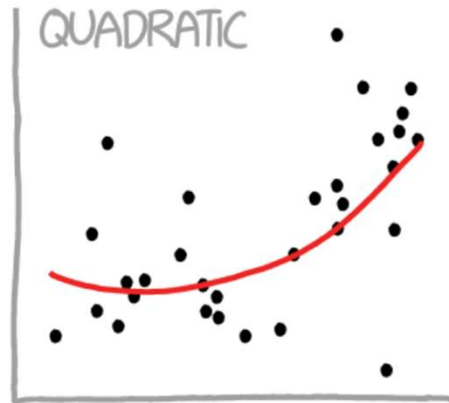
- **Date Range: Year over Year, Quarter over Quarter, Moving Average.**
- **Minimum Number of Data Points.**
- **Average Cost.**
- **Weighted Average Cost.**
- **Exclude Max. Price, Min. Price and Token Prices (i.e. \$0.01 / Unit).**
- **Low Bidder Only vs Low Three Bidders vs All Bidders.**
- **Indexing of Prices.**
- **Linear Regression – Acceptable R² Value.**
- **Non-linear Regression – Acceptable SEOR Value.**

Limitations and Challenges – Data Analysis (Regressions)

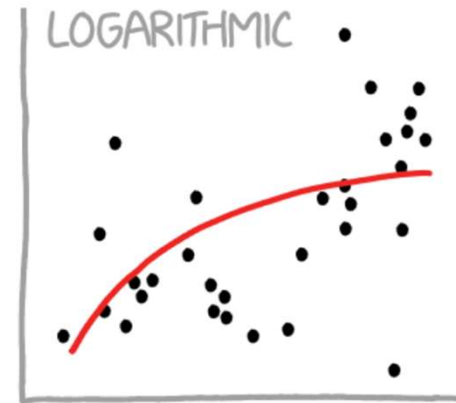
CURVE-FITTING METHODS AND THE MESSAGES THEY SEND



"HEY, I DID A
REGRESSION."



"I WANTED A CURVED
LINE, SO I MADE ONE
WITH MATH."



"LOOK, IT'S
TAPERING OFF!"

Source: <https://thevanitymetric.com/curve-fitting-methods-and-the-messages-they-send/>

Bid Item Level Inflation Analysis – One Approach

Approach Used Herein:

- Sorted Data by Largest Total Cost Programmatically, in Current Period.
- Omitted Lump Sum and Non-Standard Items.
- Prior Period, Date Range: February 1, 2023 to January 31, 2024.
- Current Period, Date Range: February 1, 2024 to January 31, 2025.
- Omitted Items Without Ample Data Points in Both Periods.
- Used Low Bidder Only Unit Price.
- Calculated Weighted Average Cost in Current Period & Prior Period.
- Calculated Measured Increase “*Inflation*” comparing the Prior Period to Current Period.

Bid Item Inflation – Items Reflecting Measurable Increase

ITEM CODE INFORMATION			02-01-2023 to 01-31-2024		02-01-2024 to 01-31-2025		Measured Increased "Inflation"	Occurrences		
ITEM CODE	ITEM DESCRIPTION	UNIT	PRIOR PERIOD	PRIOR PERIOD	CURRENT PERIOD	CURRENT PERIOD		Prior Period	Current Period	Total
			WEIGHTED AVG PRICE	% of TOTAL DBB Program	WEIGHTED AVG PRICE	% of TOTAL DBB Program				
303SD20-0001	REGULAR EXCAVATION	CY	\$27.23	2.78%	\$43.12	2.86%	58.39%	42	72	114
704SD20-0001	TYPE A PVMT LINE MRKG 4"	LF	\$0.12	0.68%	\$0.15	0.67%	25.39%	78	71	149
308SD20-0012	AGGR. BASE MATL. TY. I NO. 21B	TON	\$48.29	0.69%	\$59.60	0.60%	23.43%	37	56	93
315SD20-0036	ASPH. CONC. TY. SM-12.5E MAINT	TON	\$132.31	6.20%	\$151.33	6.96%	14.38%	29	32	61
305SP20-0003	AGR. BASE MAT. TY.I OR II NO. 21A OR 21B	TON	\$52.01	0.56%	\$56.89	0.49%	9.39%	107	99	206
323SD20-0030	TRAVEL LANE PATCHING (PATCH MIX TYPE)	TON	\$151.17	0.35%	\$163.04	0.84%	7.85%	18	52	70
704SD20-0027	TYPE B CLASS VI PVMT LINE MRKG 6"	LF	\$4.95	1.43%	\$5.21	1.30%	5.35%	51	53	104

Best Practice: Use Similar Project Cost Data

Question: How do I find a similar project?

Answer: Similar Project Estimate by Cost Category (SPECC)



Application to VDOT's Project Cost Estimates

Costs are increasing on many items, at a variable rate. However, in some cases, what appears to be a *'Inflation'* or *'Deflation'* may be related to the specific nature of the work or other factors.

Unit prices generated from a bid item analysis may or may not be an accurate reflection of reasonable costs for your project. Be very careful of using "Averages."

Application to VDOT's Project Cost Estimates

The Design-Bid-Build, bid tab unit costs, are still the best available information for our engineer's estimates.

Using the best available information along with adequate due diligence is required to generate the best and most consistent estimate!

Thank You / Questions / Contact Information

Thank You!

S. Mitchell Ball, PE, LS, DBIA
State Cost Estimation Engineer
Cost Estimation Office

Questions...

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COST ESTIMATION SUMMIT

March 10-12, 2025
Hotel Madison & Shenandoah Valley Conference Center

