

CURRENT ECONOMIC IMPACTS ON THE WTD CAPITAL PROGRAM

SEPTEMBER 28, 2022

METROPOLITAN WATER POLLUTION
ABATEMENT ADVISORY COMMITTEE



King County

Wastewater Treatment Division



Georgetown Wet Weather Treatment Station

INTRODUCTION

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Introduction

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Georgetown Wet Weather Treatment Station

PURPOSE AND DISCLAIMER

Purpose: Provide information on how current economic market conditions are impacting the Wastewater Treatment Division's (WTD's) capital program and how WTD is attempting to mitigate and account for these influences in future forecasting.

Disclaimer: I am NOT an expert on the economy. For financial advice or a theory on where the economy is headed, see a financial advisor or crystal ball.

DISCLAIMER

LEVEL SETTING- INFLATION VS. ESCALATION

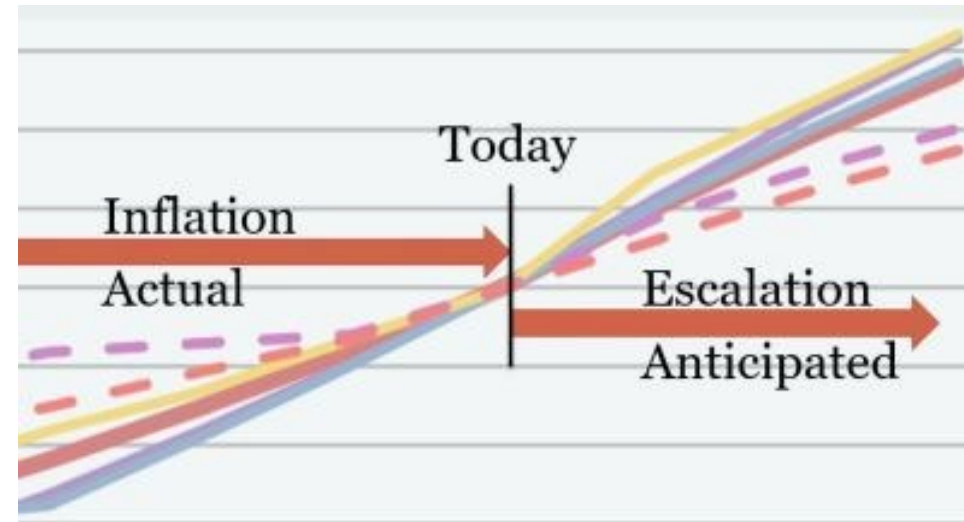
What is inflation?

In economics, inflation is a general increase in the prices of goods and services in an economy. When the general price level rises, each unit of currency buys fewer goods and services; consequently, inflation corresponds to a reduction in the purchasing power of money.

What is escalation?

"Escalation refers to a persistent rise in the price of specific commodities, goods, or services due to a combination of inflation, supply/demand, and other effects such as environmental and engineering changes."

Source: Penn State- Inflation and Escalation in Economics



LEVEL SETTING- WHAT CAUSES INFLATION

What Causes Inflation?



Cost-push Inflation:

When production costs rise and the producers pass the increase on to consumers.



Demand-pull Inflation:

When demand for goods increases and exceeds production capacity.



WAGE PRICE SPIRAL





MARKET INFLUENCES

A PERFECT STORM OF DISRUPTIONS

MARKET INFLUENCES- INFLATION

General Economy

As of Q2 2022 general inflation is now at a 40-year high. The three-year average percentage remains above 4%.

Construction

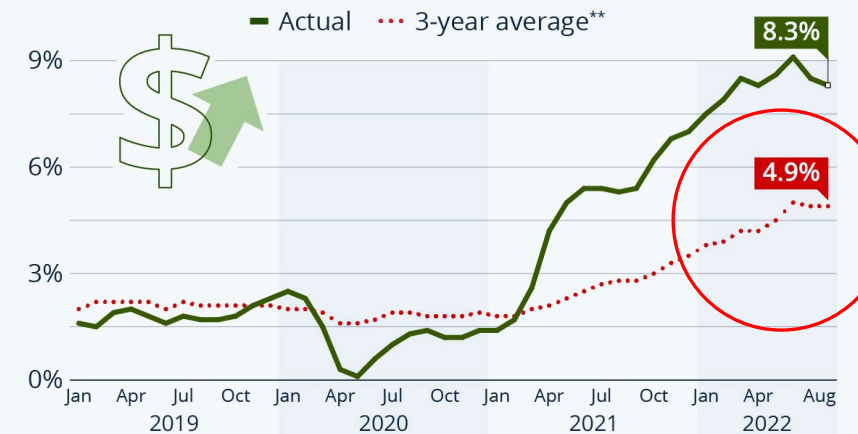
- The annual nonresidential construction inflation rate came in at 19.6% for 2021.
- The nonresidential construction inflation rate was 4.4% in 2020 and 1.8% in 2019.
- Nonresidential construction inflation has not exceeded 5% a year for the last 32 years.

In July 2022, citing continued supply chain and labor market impacts, the Associated General Contractors of America (AGC) issued an Inflation Red Alert to its members.

Sources: Associated General Contractors of America July 2022; Construction Financial Management Association; Statista

Inflation Shows Little Signs of Cooling in August

Year-over-year change in the Consumer Price Index for All Urban Consumers in the U.S.*



* not seasonally adjusted

** average annual increase of the CPI-U over the previous three years

Source: Bureau of Labor Statistics



statista

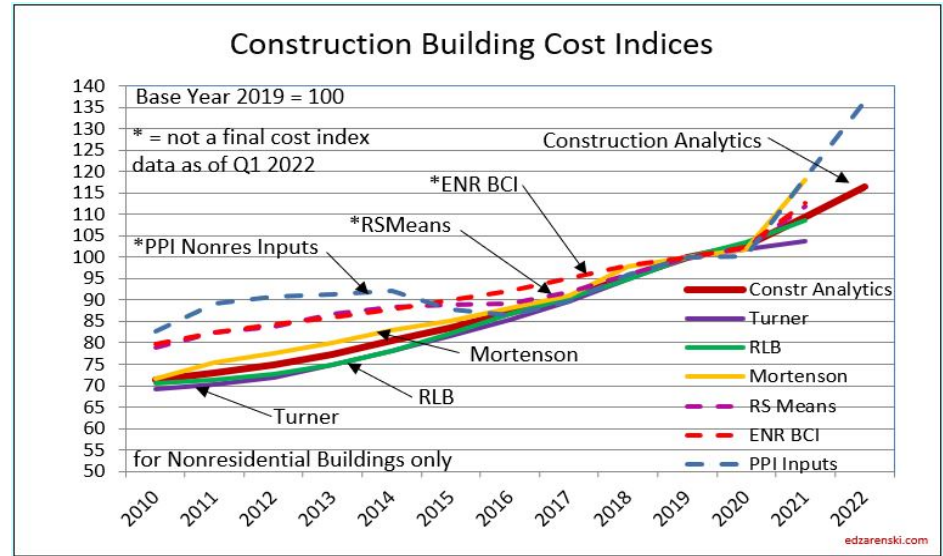
MARKET INFLUENCES- MATERIAL COSTS

All Construction Cost Indices Show Same Trend

All major construction costs indices both nationally and locally show the same continued upward trend in the industry since the lows of 2010. The Mortenson Cost Index is showing a single quarter increase of 3.3% nationally and 2.9% in Seattle for the second quarter of 2022.

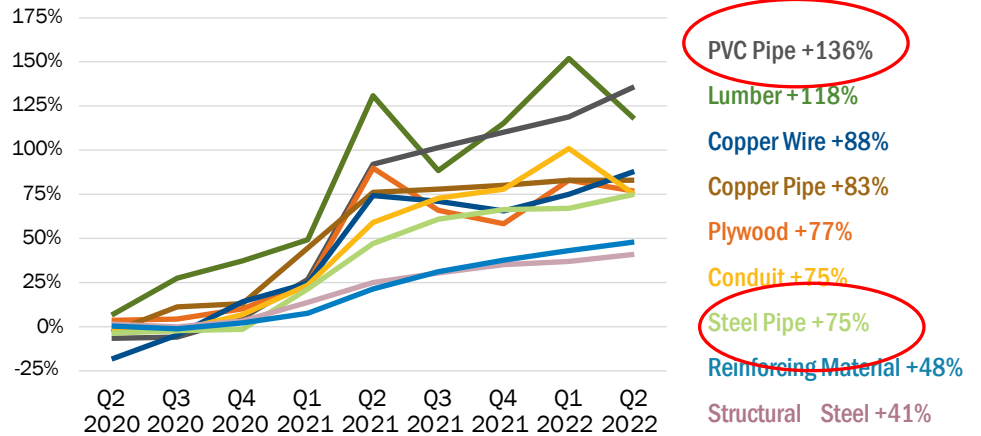
Double- and Triple-Digit Growth in Material Costs

Prices for almost all raw construction materials have increased significantly since the pandemic. In Seattle metro area, PVC Pipe (including HDPE) and Steel Pipe alone have increased 136% and 75% respectively in the last 2 1/2 years.



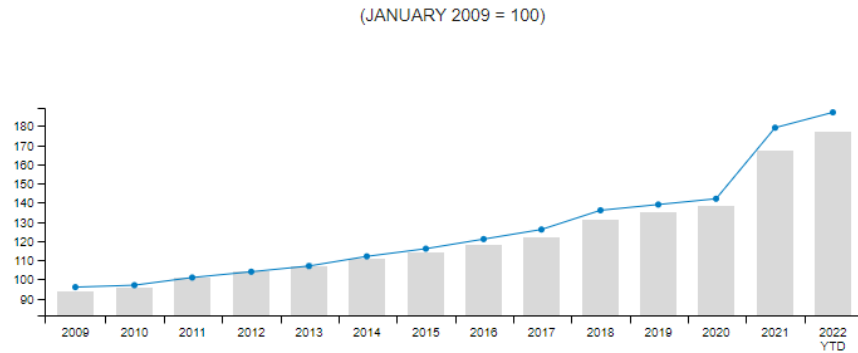
MATERIAL PRICING CHANGES-Seattle

(Cumulative Q2 2020 to Q2 2022)- Mortenson Cost Index



Costs for building materials remain escalated due to continued increases in shipping costs, fuel surcharges, product lead times, and material shortages.

CONSTRUCTION COST INDEX



Sources 1. Bureau of Labor Statistics, U.S. Department of Labor. (2022, July 14). Producer Price Indexes—June 2022. <https://www.bls.gov/news.release/pdf/ppi.pdf> 2. Bousquin, J. (2022, July 15). Peak pricing? June's PPI shows signs of relief for construction materials. <https://bit.ly/3J5B19O> 3. Federal Reserve System. Beige Book – June 1, 2022.

MARKET INFLUENCES- SUPPLY CHAIN

Ongoing Pandemic

Availability and delivery times for all materials and specifically construction materials have been impacted significantly since early 2020.

Invasion of Ukraine

Blockages of cargo ships are impeding or cutting off supplies of items as diverse as pig iron used in steelmaking and neon for lasers used in semiconductor manufacturing.

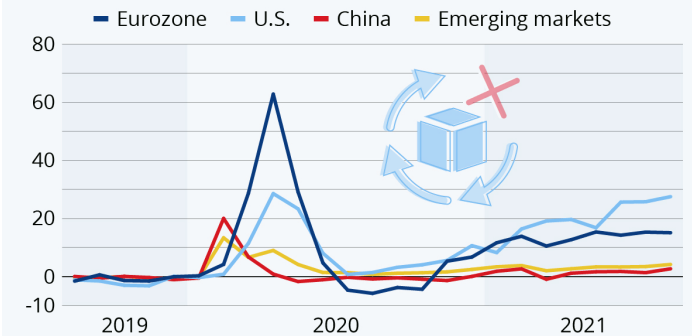
Domestic Disruptions

- Severe freeze in Texas in February 2021, damaged all the petrochemical plants producing resins for a host of construction plastics.
- Damage to the electrical grid in Louisiana from Hurricane Ida in late 2021, further interfered with the production of some plastics inputs.
- Local Seattle cement plants have incurred unusually long outages, in part because of delays in sourcing replacement parts and in part because of the prolonged driver's strike.

Sources: Associated General Contractors of America July 2022; Construction Financial Management Association; Statista

Supply Chain Disruptions Make a Comeback

Index of global supply chain disruptions (100=most disrupted)



Based on the difference between the supply delivery times subindex and the supply delivery times based on manufacturing output subindex (both part of the PMI)
Source: IMF



statista

No relief in sight: The AGC advised in July 2022 that “there is little sign that the supply chain will consistently improve before 2023—or even 2024” and that , “the expiration of labor contracts for West Coast longshore workers and rail workers nationwide could result in new disruptions.”

MARKET INFLUENCES- LABOR MARKET

Pandemic Impact on trade workers

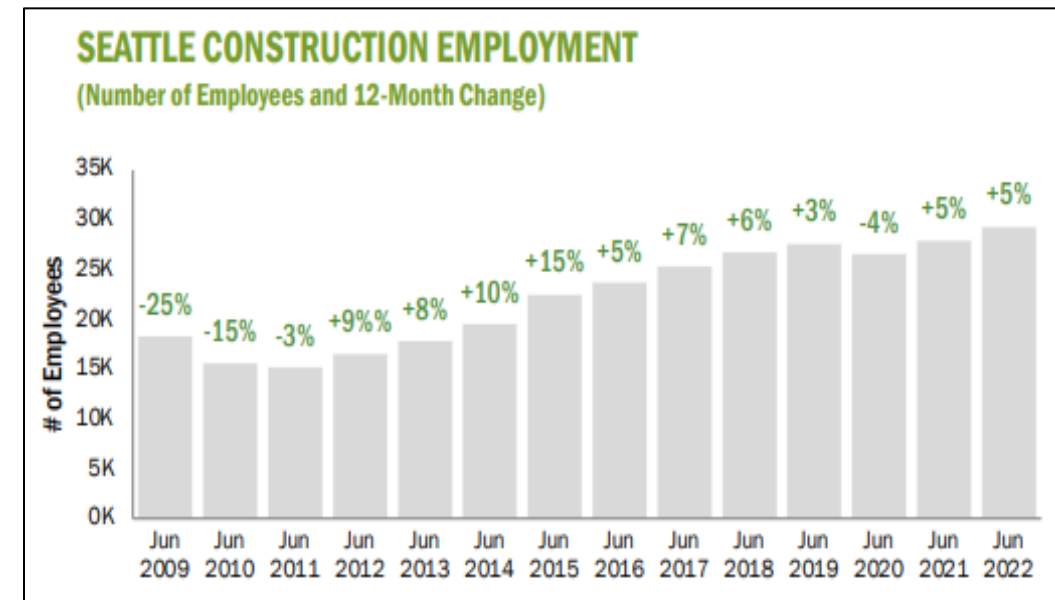
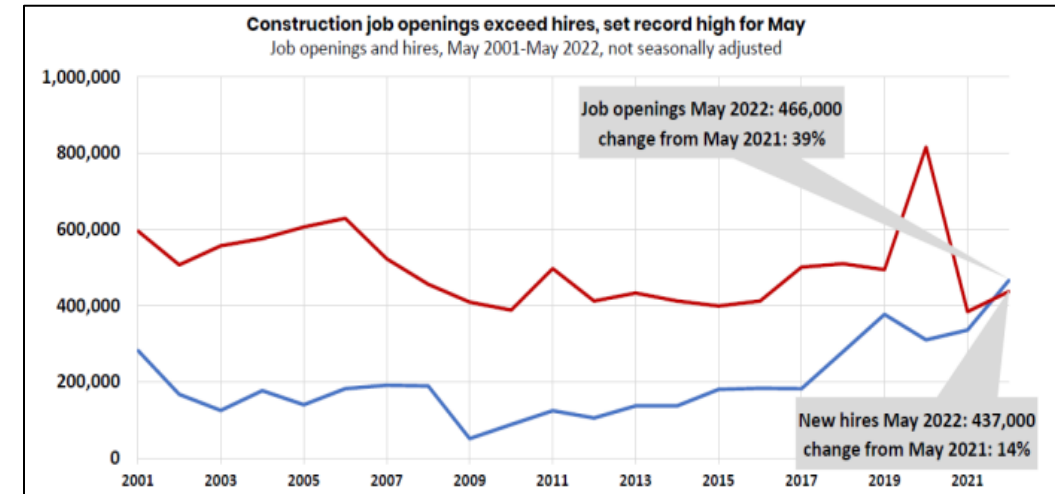
- The construction industry lost 1.1 million employees from February to April 2020 a 15% decline in just two months.
- Employment stalled for an additional year in certain construction sectors.
- Thousands of experienced workers moved into residential construction (homebuilding and remodeling), found jobs in other sectors, or left the workforce completely.

Rebound in activity leads to shortage in labor

- Job openings in construction at the end of May showed an increase of 39% from a year earlier.
- For the first time in the 22-year history of the data, job openings exceeded the workers hired, implying a shortage of qualified applicants.

Labor shortage not isolated to trade workers

- Similar labor shortages in engineering and other professional services in the construction industry.



Sources 1. Bureau of Labor Statistics, U.S. Department of Labor. (2022, July 14). Producer Price Indexes—June 2022. <https://www.bls.gov/news.release/pdf/ppi.pdf> 2. Bousquin, J. (2022, July 15).. Mortenson Cost Index

Construction employment in the Seattle metro region totaled 29,300 in June 2022. This is a 5% increase (1,400 jobs) compared to June 2021. Labor availability will remain a top concern throughout 2022.

Source: Bureau of Labor Statistics

MARKET INFLUENCES- REAL-ESTATE

Record breaking increases

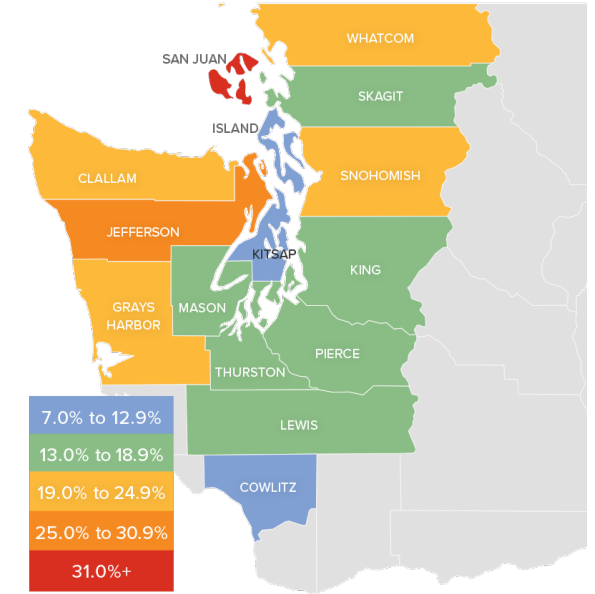
- In late 2021, Seattle-area real-estate prices saw the biggest 12-month jump EVER (25.5%) in the history of recording local real-estate data.
- While year over year data in 2022 has showed signs of cooling, July 2022 still showed a 6.5% increase over the previous year.

Home prices DO impact infrastructure and non-residential construction costs

- Residential real estate price increases impact the costs of land, Right-of-Way, and easements for public infrastructure projects.

Vacant land inventories historically low

- Available vacant parcels of one-acre or greater in the Seattle area at historically low levels.
- Lack of empty land often leads to purchasing parcels that have already been developed and require significant demolition, adding to overall project costs.




Median sold price for King County single-family homes



Sources: Northwest Multiple Listing Service, Seattle Times, King County

Graphs were created by Windermere Real Estate using NWMLS data



IMPACTS TO WTD PROJECTS AND PROGRAMS

IMPACTS TO WTD PROJECTS-DESIGN COSTS

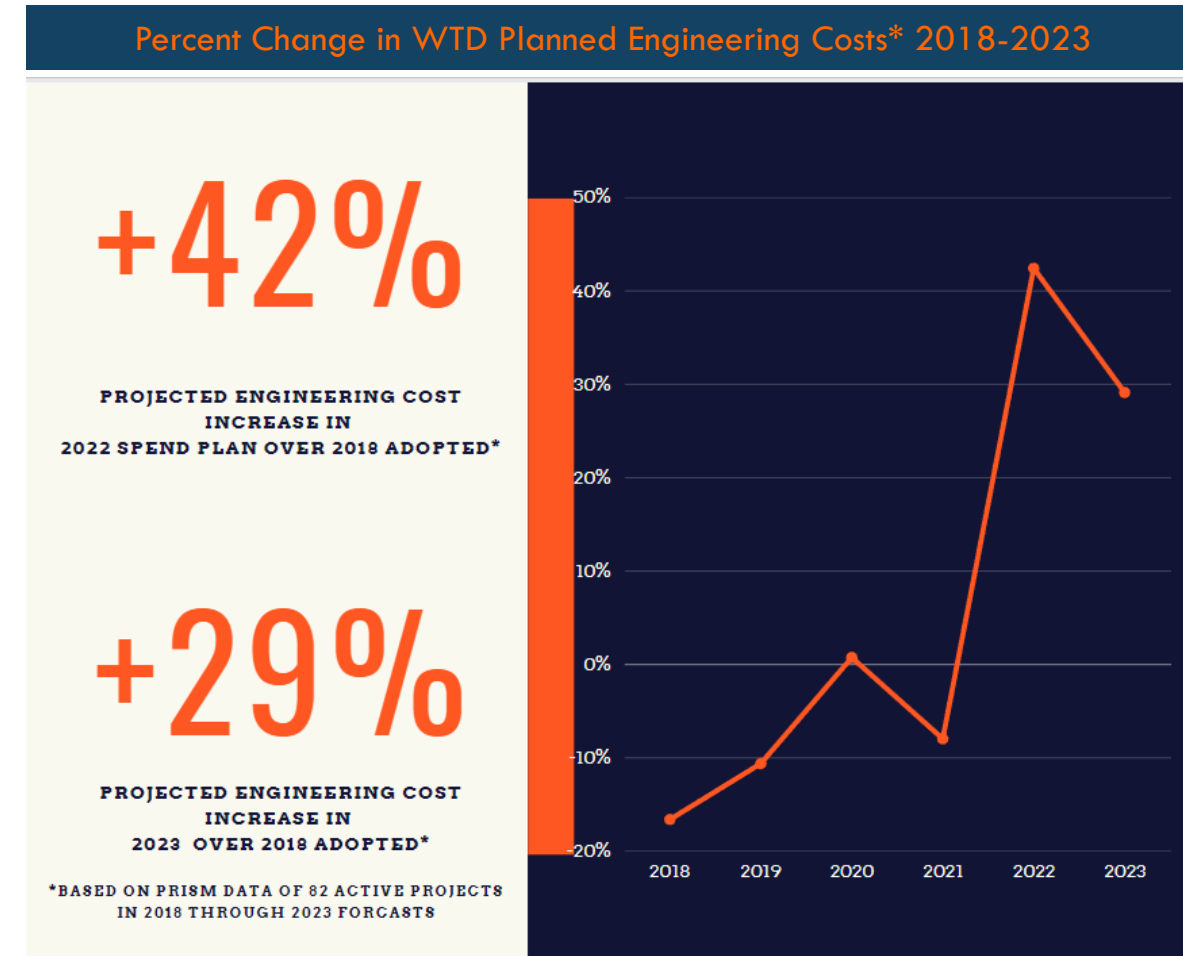
Labor shortage equals higher cost per hour

- Severe shortages in engineering and professional services companies has led to an increase in “billable rates.”
- This increase in labor cost is passed directly to WTD on all design, engineering, and professional service contracts.

Pandemic Delays in Projects Exacerbate Problems

- Due to the uncertainty around the pandemic, new nonresidential and public infrastructure project starts declined sharply during the first half of 2020 in the Seattle area.
- While WTD did not delay many projects, the projects that were delayed by many of our regional partners in 2020 have since re-started and are flooding the design and engineering consultant market in our region with new projects.
- In 2021, King County central procurement saw a year over year increase of 74% in the volume of professional service RFP’s requested and is on pace to exceed that number in 2022.

Source: PRISM, King County BRC BI Insights, Bureau of Labor Statistics, U.S. Department of Labor. (2022, July 14). Producer Price Indexes—June



IMPACTS TO WTD PROJECTS-CONSTRUCTION COSTS

Existing Construction Contracts

- Since mid-2021, WTD has received request for change orders (RCO) for price escalations and procurement delays of raw materials and equipment due to supply chain issues and inflation.
- Reasons cited for these RCOs include market volatility, time elapsed between contract bid and notice to proceed, manufacturers and vendors not honoring bid prices, raw material shortages, the COVID-19 pandemic, and the war in Ukraine.

Recent Construction Bid Prices

- Variance between the low-bid and the engineer's estimate for fixed-priced contracts has increased from an average variance of -5.4% in 2019 to an average variance of 34.6% in 2022.

Future Project Estimates

- Construction estimates have begun including significant estimate contingencies for “market conditions” and “material cost escalation.”

Source: PRISM, Patrick Dodd, Associated General Contractors of America July 2022

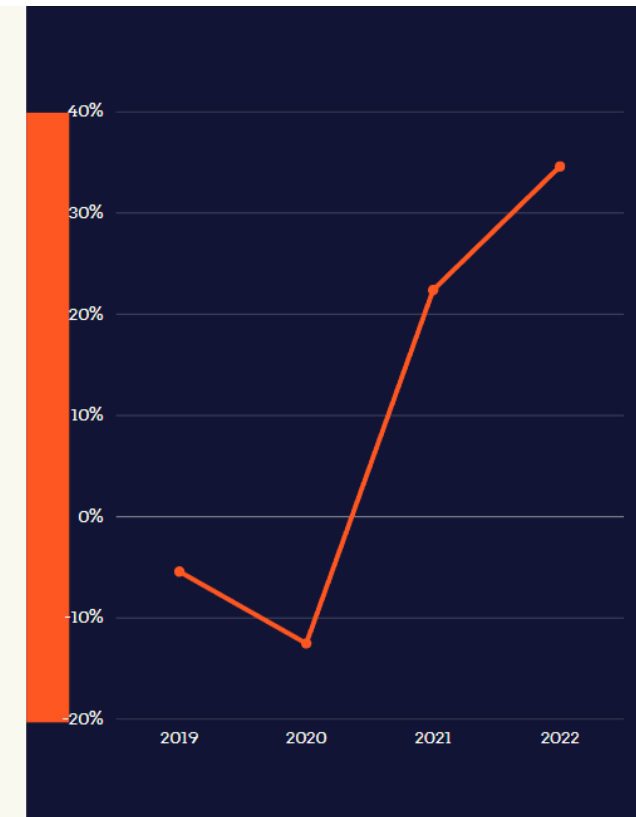
Percent Variance Between Engineers Estimate and Construction Bids

+22%

AVGERAGE VARIANCE
BETWEEN ENGINEER'S
ESTIMATE AND LOW BID
IN 2021

+34%

AVGERAGE VARIANCE
BETWEEN ENGINEER'S
ESTIMATE AND LOW BID
IN 2022



IMPACTS TO WTD PROJECTS-SCHEDULE DELAYS

Construction Material Leadtime Delays

- Supply chain disruptions have been on-going since 2020.
- Wastewater process equipment saw significant lead time increases over the last 3 years.
- Sample of lead-time increases for WTD equipment:

Grit trap	22 to 32 weeks	+45%
Mixers	20 to 28 weeks	+40%
Pumps	18 to 26 weeks	+44%
Blowers	30 to 36 weeks	+20%
Switchgear	20 to 40 weeks	+100%
Motor Control	18 to 32 weeks	+77%

Low Bidder Turnout/ Procurement Delays

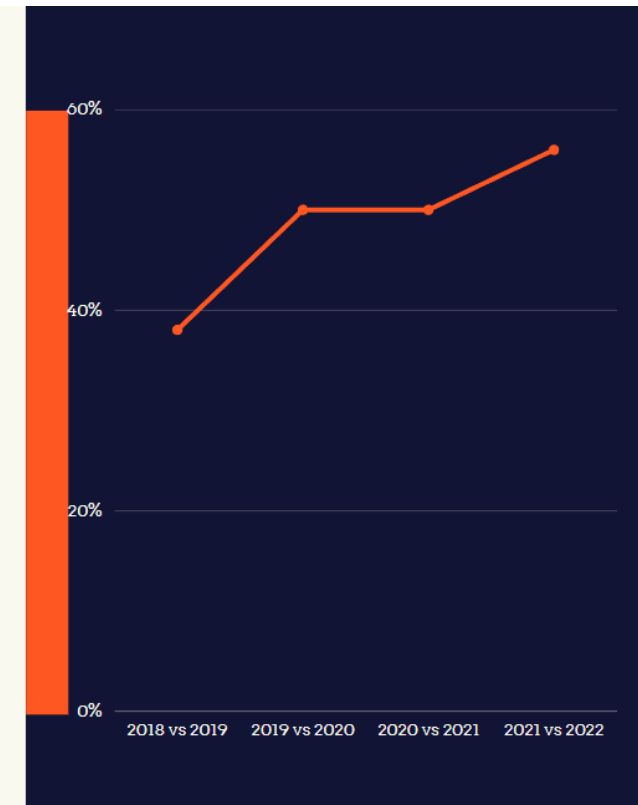
- WTD has experienced extremely low bidder turn out.
- In 2022, WTD saw zero bids on two projects and only one bid on six other projects.
- Lack of competition drives up costs and leads to significant schedule delays as projects require to re-bid.

Source: PRISM, Patrick Dodd, Jacobs Engineering Group, BRC Bi Insights

Percentage Increase In WTD Projects with Substantial Completion Delays

56%
PERCENTAGE OF WTD
PROJECTS WITH A
SUBSTANTIAL COMPLETION
DELAY IN 2022

33%
PERCENTAGE INCREASE
IN PROJECT DELAYS
2018-2022



IMPACTS TO WTD PROJECTS- TOTAL PROJECT IMPACTS

Total Project Costs for Active Projects

- Overestimating the cost of these ever-changing impacts can artificially inflate budgets and lead to underspending and low accomplishment rate.
- Underestimating these impacts can lead to significant unrealistic spending plans and impacts to future projects as available resources are pulled to existing active projects.
- WTD has seen a 25% increase in projected total costs of 82 projects that were active prior to 2020.

Future Projects Resources

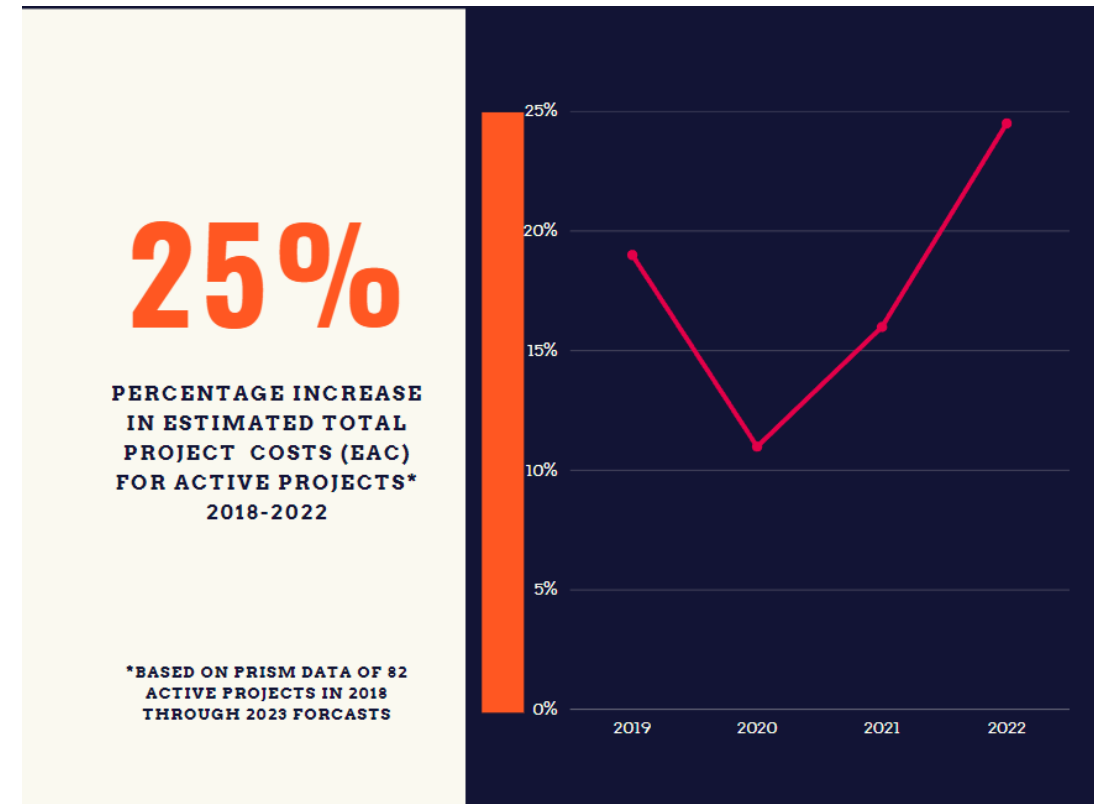
- Supply chain issues, material and labor cost increases and extended lead-times must be considered when developing future project schedules and estimates.
- This causes future project costs and durations to be increased, committing more of the finite available resources in WTD's capital program.

Real-estate and ROW

- Seattle and King County have seen record increases in property costs for more than a decade.
- WTD saw 50% increase in these costs for active projects in 2021.

Source: PRISM

Percentage Increase in Total Active Project Costs 2018-2022





MITIGATION MEASURES

MITIGATION MEASURES

Market Risk Based Contingencies in Estimates

- Due to the significant increases in both construction materials and construction labor costs and the continued uncertainty in the market, WTD estimates for projects include market risk-based contingencies.
- The value of these contingencies (typically 3%- 35%) are adjusted based on specifics of the project, including materials and equipment required and construction trade labor estimates.

Potential Material Cost Increase Contract Language

- Currently, nearly all County construction contracts are awarded to the lowest responsive and responsible bidder.
- These contracts typically don't allow for fluctuation in material and equipment cost fluctuations after bid.
- This forces bidders to estimate the amount of these potential cost increases for the life of the contract and leads to bid significantly higher bids versus engineers estimates.
- King County is evaluating the standard contract language to allow for contract adjustments for key material and equipment costs fluctuation after bid.



Storage Tank at Murray CSO Control Project

MITIGATION MEASURES

Long Term Escalation Percentage

- Traditionally, WTD has applied an escalation percentage of 3% per year to all project forecasts in future years.
- While the 10% average inflation growth percentage is currently still slightly below this 3% mark, the 5-year average (currently at 4.8%) shows signs of a longer trend.
- WTD to consider increasing the traditional 3% escalation applied to project budgets for future years.

Strategies for Supply Chain Stability

- King County is exploring buying and procurement strategies intended to mitigated supply risks.
- Strategies might include purchasing owner furnished equipment earlier and purchasing commonly used equipment well ahead of time in anticipation of future users.
- Additionally, contracts with redundancy in the supply of some commodities, such as chemicals used in the treatment process, are being implemented.



WestPoint Treatment Plant

