TEA Annual Conference 2024

“Inflationary Pressures on Labor, Equipment and Materials”

August 07, 2024

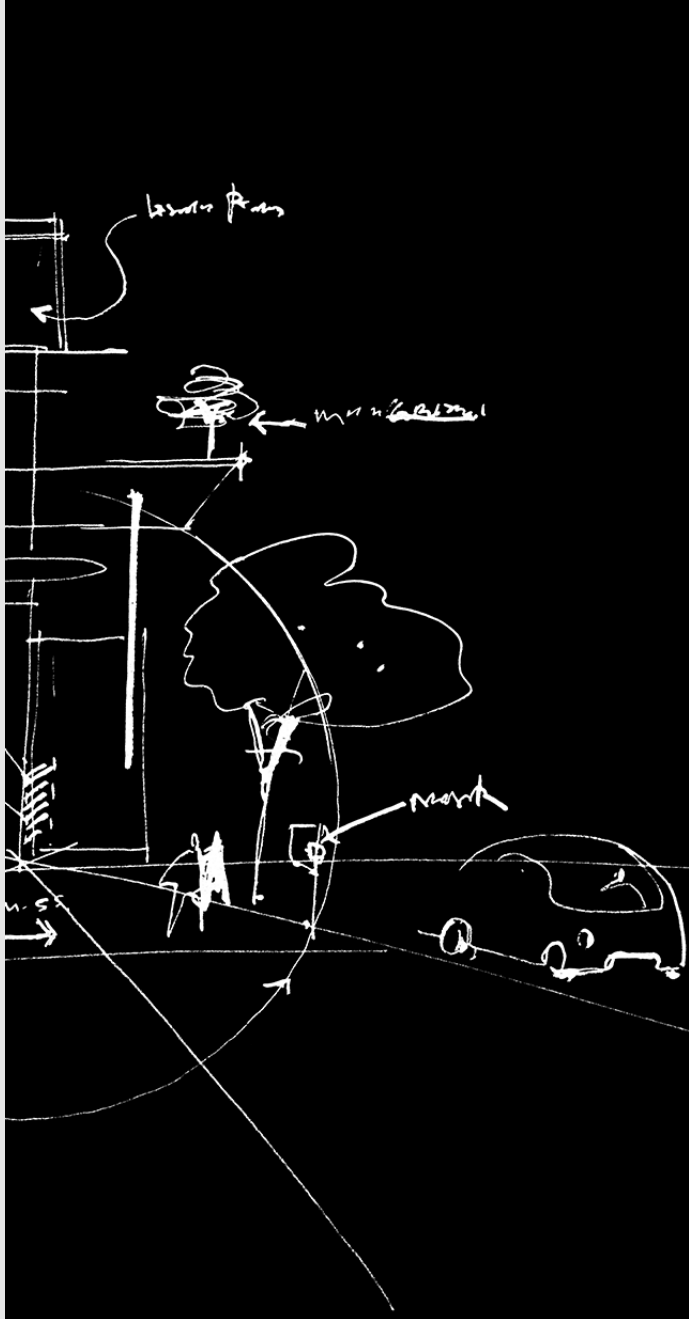
Jacobs

Challenging today.
Reinventing tomorrow.

“Inflationary Pressures on Labor, Equipment and Materials”

Agenda

- Introduction
- A look back (4 years)
- Craft Labor
- Construction Equipment
- Materials/Commodities
- Impacts To Bids/Costs
- Conclusion – What does this mean for cost estimates?



INTRODUCTION

Ben Kamph – Transportation Estimating Manager - Americas

- Education: BS Civil Engineering, Oregon State University
- Years Experience: 25
- Years at Current Employer: 13
- Former Employers: Granite Construction, Kamph Construction
- Career Lowlight: Failed Business (2005-2009)
- Career Highlight: 1.5% ICE above $1 billion LA Metro Gold Line bids (2019)
- Favorite Past Times: Family, Baseball, Ancestry, Rice Krispy Treats

Ben Kamph – Transportation Estimating Manager - Americas

Current Projects (over $5 billion)

- Frederick Douglass Tunnel - Amtrak
- I-285 Top End Express Lanes - GDOT
- Sepulveda Transit Corridor – LA Metro
- Yonge North Subway Extension SRS - Metrolinx

Current Projects (over $100 million)

- ADA Ramp Mitigation - ODOT
- Foothill Gold Line – Foothill Gold Line Construction Authority
- Ship Channel Bridge - HCTRA
- STRIDE BRT – Sound Transit
- TEX Rail Segment 1 – Trinity Metro

A LOOK BACK

SUMMARIZING THE CURRENT MARKET

OVER THE LAST 4 YEARS…

IMPACTS

Significant Supply Chain Impacts: delays, availability, lead times, price impacts + supplier leverage impact

+40%

Material/Commodity Inputs have increased +40% (8-9% annually)

+25%

Labor costs have increased +25% (4-5% annually) while skilled workforce availability decreasing

DEMAND

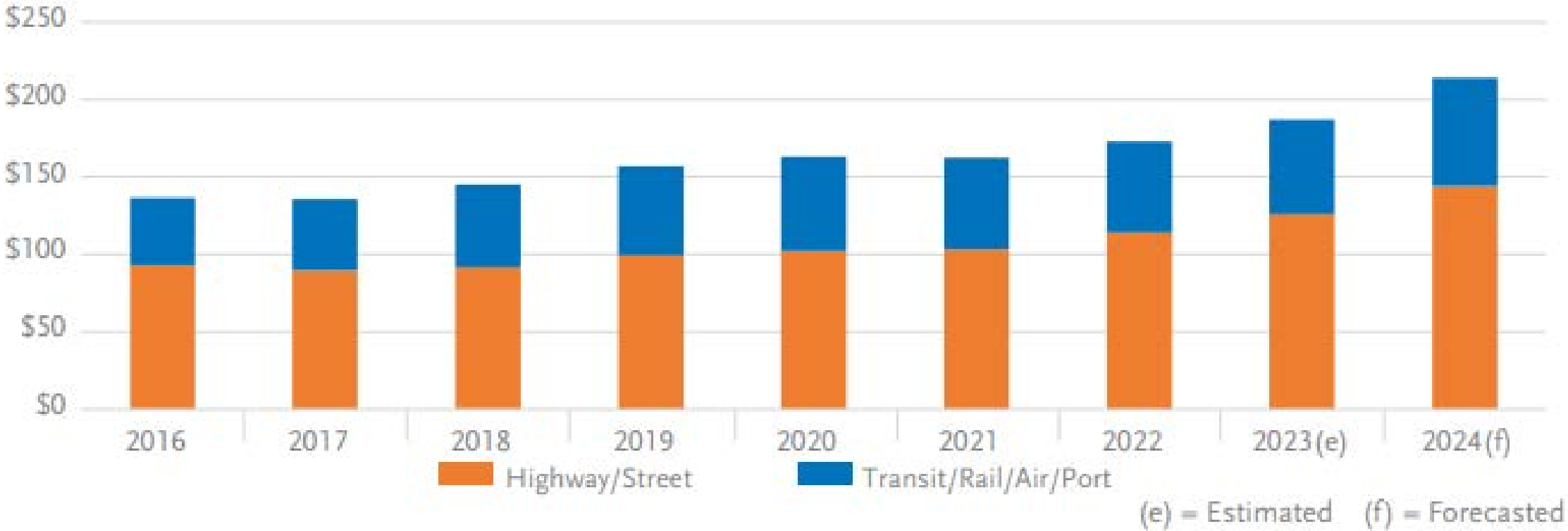
Demand is higher than ever – unprecedented spending in the construction sector

SAFETY

Industry Safety data is starting to show a decline in performance, increase in fatalities

Figure 8

National Annual Transportation Construction Spending ($ in Billions)

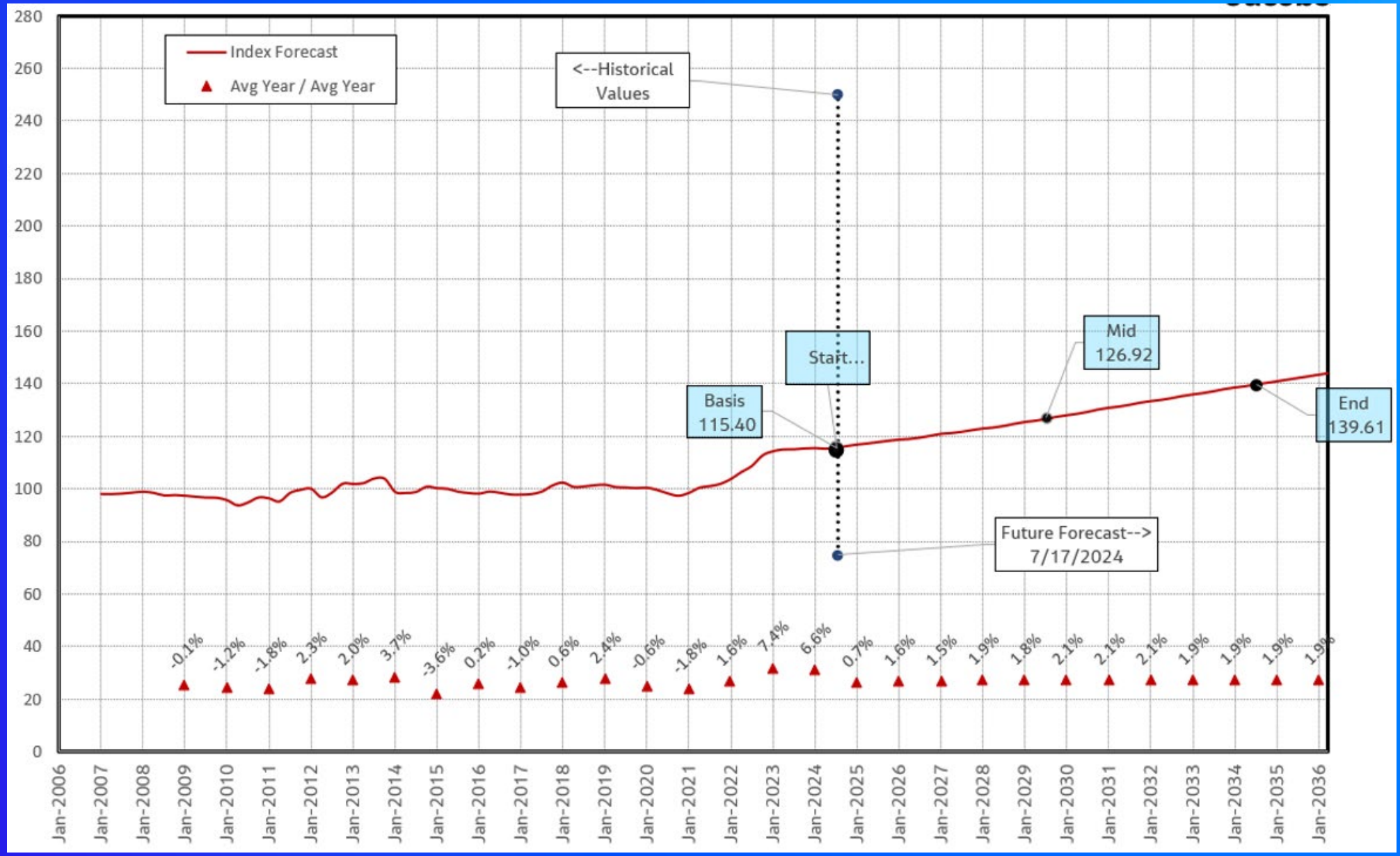


Source: American Road & Transportation Builders Association (2023)

Table 3: Above-ground Index by Year

Year	Above-ground Index
2020	1.176
2021	1.241
2022	1.295
2023	1.349
2024 (to date)	**1.333**

Figure 3: Above-ground Tunneling Wage Index from 2020 to 2024


Index Forecast
Avg Year / Avg Year
<--Historical Values
Basis 115.40
Start...
Mid 126.92
End 139.61
Future Forecast--> 7/17/2024
-0.1%
-1.2%
-1.8%
2.3%
2.0%
3.7%
-3.6%
0.2%
-1.0%
0.6%
2.4%
-0.6%
-1.8%
1.6%
7.4%
6.6%
0.7%
1.6%
1.5%
1.9%
1.8%
2.1%
2.1%
2.1%
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Jan-2034
Jan-2035
Jan-2036

CRAFT LABOR

Figure ES-3

Comparison of EDD's Construction Employment Projection and Forecasted Construction Labor Demand (in job years)

Wages

Labor shortages and inflationary pressures continue to push up craftworker wages at rates not seen in decades. Both union and open-shop pay are on the rise, as employers fight to attract and retain workers to meet the high volume of demand. Wage increases are also driven by the cost of living resulting from inflation. Figure 24 shows the national average hourly rates by craftwork and the percentage change in hourly rates between 2022 and 2023.

In 2023, union labor settlements increased wages from 3.6% to 4.5%.[37] The current first-year settlements are on track to equal or surpass the high watermark of 4.6% set in 2008. This upward trend will continue as union settlements are almost always multi-year contracts, and the current increases lag behind demand. The highest wage increases appear to be on the West Coast according to statements from union contractor groups in ENR's 2023 Q3 Cost Report. The report speculates that federal investment demand for megaprojects over the next several years will drive wage increases to above 5% in 2024 and 2025.

Demand for megaprojects fueled by federal investment spending will drive wage increases above 5% in 2024 and 2025.

Figure 24

Hourly Rates by Craftworker

CEMENT MASONS

$29.54
2023 U.S. Average

4.36%
Annual % Change

ELECTRICIANS

$29.54
2023 U.S. Average

4.49%
Annual % Change

EQUIPMENT OPERATORS

$33.90
2023 U.S. Average

4.30%
Annual % Change

LABORERS

$22.81
2023 U.S. Average

4.43%
Annual % Change

IRONWORKS

$31.84
2023 U.S. Average

3.98%
Annual % Change

Source: ENR Q3 Cost Report (2023)

Openings versus Hirings

For the last two years, job openings have generally outpaced the number of hires, as shown in Figure 22. This indicates a severe shortage of construction labor as a result of high construction activity combined with the historic levels of employment and unemployment rates.

This issue is further reinforced by the results of the AGC 2023 Workforce Survey, as shown in Figure 23. The survey reveals that among firms with openings, 88% are struggling with filling the positions, especially craft labor that requires onsite construction work.[35] This challenge is across the board, with similar results reported by large and small contractors, ones that use exclusively union labor, and others that operate as open-shop employers, and across geographies.

The survey also reveals the main reason the labor shortage is so severe in the construction industry is that most job candidates are not qualified to work in the industry. More than two-thirds of contractors responded that applicants lack the skills to work in construction.[36]

Figure 23

AGC 2023 Workforce Survey – Labor Shortage by the Numbers

88% of contractors are having a **hard time filling craft labor**

68% of contractors find available **candidates are not qualified** and **lack the needed skills**

69% of contractors expect to have **additional job opening** in the **next 12 months**

60%+ of contractors have **increase investment** in **online recruitment, and training and professional development**

Source: AGC (2023)

Figure 22

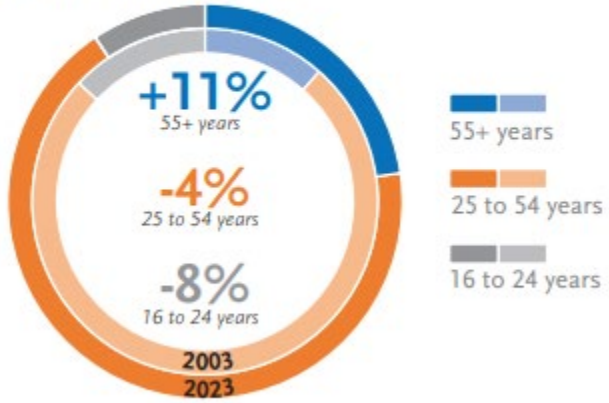
National Construction Job Openings versus Hiring

Demographics

With all-time highs for employment and all-time lows for unemployment, the industry is gravely concerned about sustaining current construction demands. Figure 20 looks at the demographics of construction labor over the last 20 years, which shows that the share of construction workers 55 and older has nearly doubled from 12% to 23%.[32] In part, this increase reflects the aging of the population. However, the 16 to 24 age group has declined by 4%, and the 25 to 54 age group has decreased by 8% over the same period.[33] Regarding gender, Figure 21 shows that the construction industry has made only a modest gain of 2% in the last ten years in terms of the share of women in the workforce.[34]

Figure 20

Construction Employment Age – 2003–2023 Comparison



Source: Bureau of Labor Statistics Construction Industry Spotlight (2022)

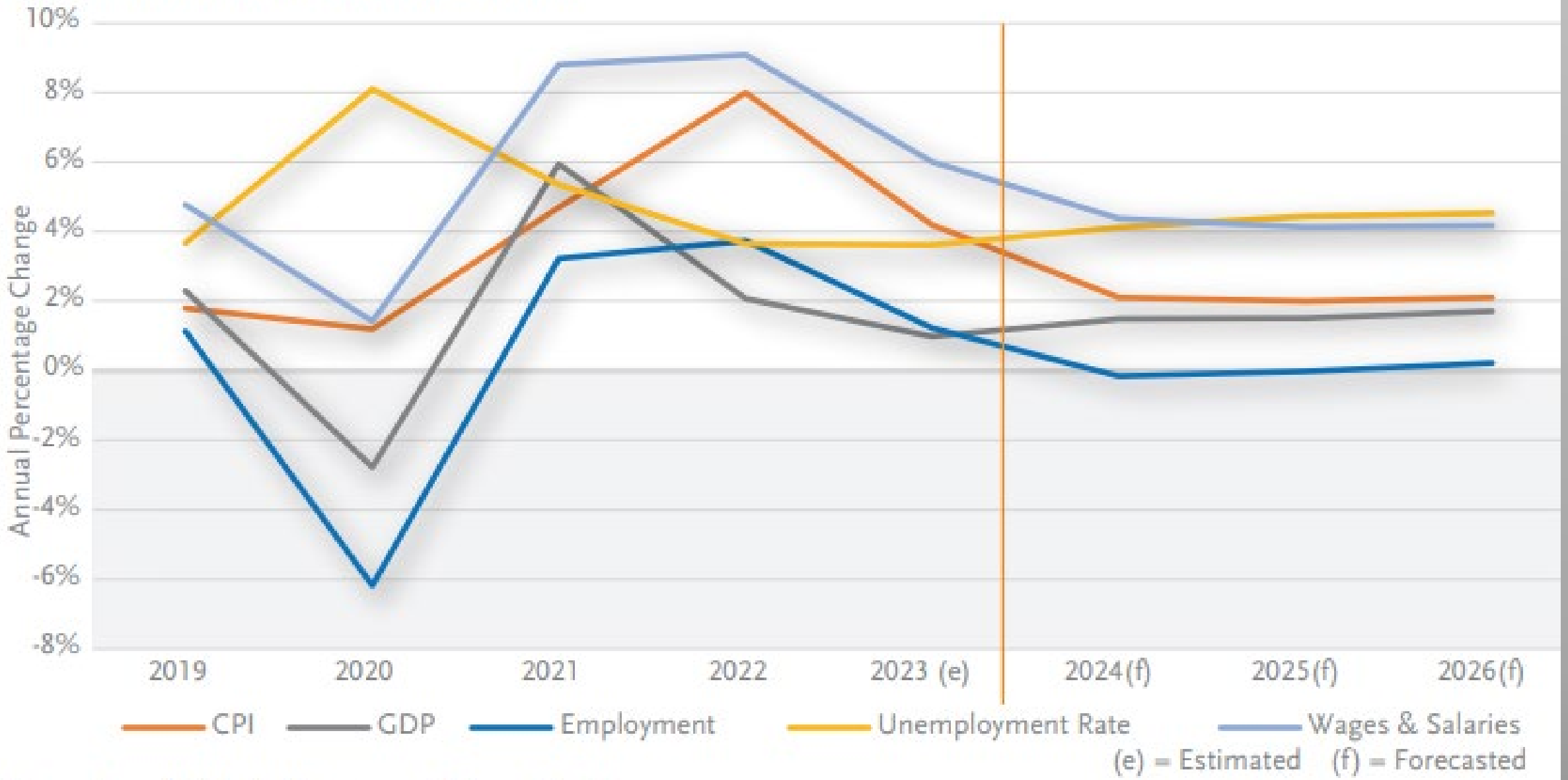
Figure 21

10-Year Comparison of Women in the Construction Workforce

Men	Women
91% 2013	9% 2013
89% 2023	11% 2023
2% difference	*Change in women participating in the construction workforce*

Figure 6

Three-Year National Economic Outlook



Forecast: 2026 to 2029

A forward-looking Construction Wage Index was calculated taking into consideration trends in construction wages in Maryland and neighboring states in the last 10 years. A confidence interval of 5% is used to calculate the Low and High scenarios for wage growth.

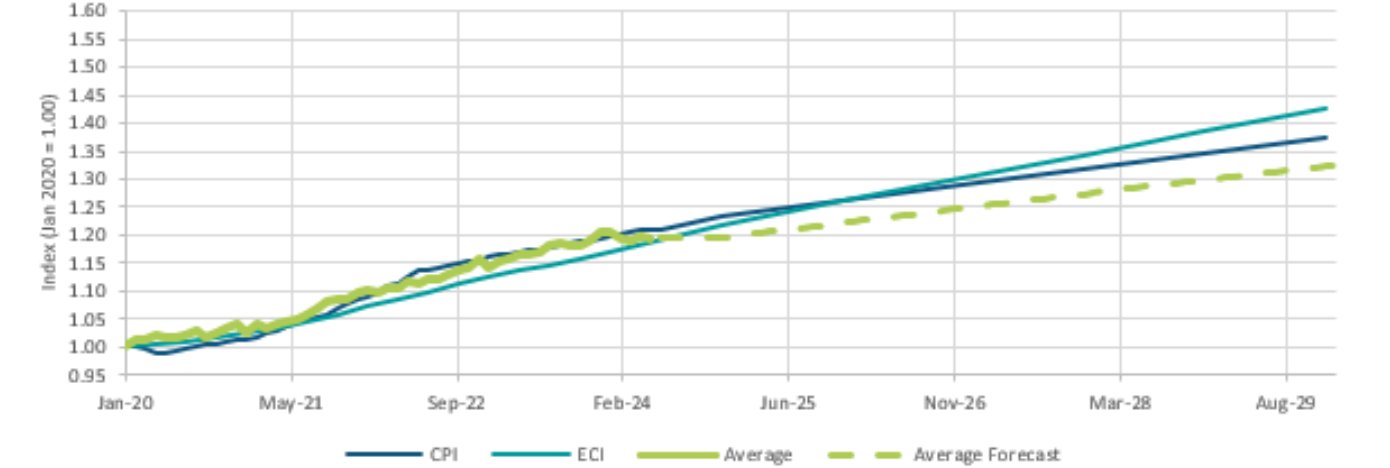
The resulting mid-forecast shows a modest growth in line with economic indicators for growth, shown in Table 4.

The low-scenario is representative of a return to the lower costs seen pre-pandemic, whereas the high-scenario is more representative of a continuation of these high-cost escalations.

Table 5: Construction Wage Forecast & Economic Indicators

Year	Low	Base	High	Consumer Price Index	Employment Cost Index
2025	-2.84%	2.73%	7.81%	2.4%	3.5%
2026	-4.47%	2.65%	8.52%	2.2%	3.3%
2027	-6.02%	2.58%	8.82%	2.2%	3.1%
2028	-7.61%	2.53%	8.87%	2.2%	3.1%
2029	-7.75%	2.52%	8.87%	2.2%	3.0%

Figure 7: Construction Wage Forecast & Economic Indicators



EQUIPMENT

Machinery and Equipment

Contractors struggled with acquiring construction machinery and equipment over the last three years. Many found creative solutions and sources to their purchasing needs. A shortage of critical electronic control chips—found in many models of construction equipment and automobiles—due to supply chain issues was a major driver of the lack of availability of new machines these past years. However, the shortage appears to have been resolved, and major indicators, such as machine age and usage, are normalizing in accordance with historical trends.[28]

Original equipment manufacturers foresee production stability, but prices could remain volatile, while spare parts, labor or maintenance, and operating costs have risen steadily for several categories of machines, according to the latest EquipmentWatch data.[29] It is anticipated that machinery and equipment prices will rise (refer to Figure 17) because contractors extended the useful life of machinery and equipment during the pandemic but are now looking for replacements and bidding up prices, per EquipmentWatch.

Figure 17

Average Annual % Change in Machinery and Equipment

Source: ENR & EquipmentWatch (2023)

6%	2%	0%
percent change in last 12 months	*percent change in last 6 months*	*percent change in last month*

FUTURE (2024 TO 2026)

2%	3%	3%
2024	*2025*	*2026*

Fuel

Fuel has been subject to cyclical trends (refer to Figure 12), making it challenging to price in construction projects. As an example of the volatile swings, fuel experienced its lowest price in May 2020 and reached historic peak levels in June 2022. After reaching unprecedented prices, fuel prices saw a general decline in 2023, according to the Bureau of Labor Statistics.[18] During this decline, fuel prices experienced some volatility that can be attributed to global and local factors, including the following:[19]

> An increase in the price of crude oil determined by geopolitical events and a global market

> Unanticipated refinery maintenance events causing decreases in supply

> Unusual California spot market transactions caused an outsized effect on gas prices

Fuel prices are anticipated to increase in 2024 due to Organization of Petroleum Exporting Countries (OPEC+) production cuts according to the U.S. Department of Energy's Energy Information Administration (EIA). The EIA also anticipates that historic levels of U.S. production will help keep fuel prices steady in 2025.[20]

Figure 12

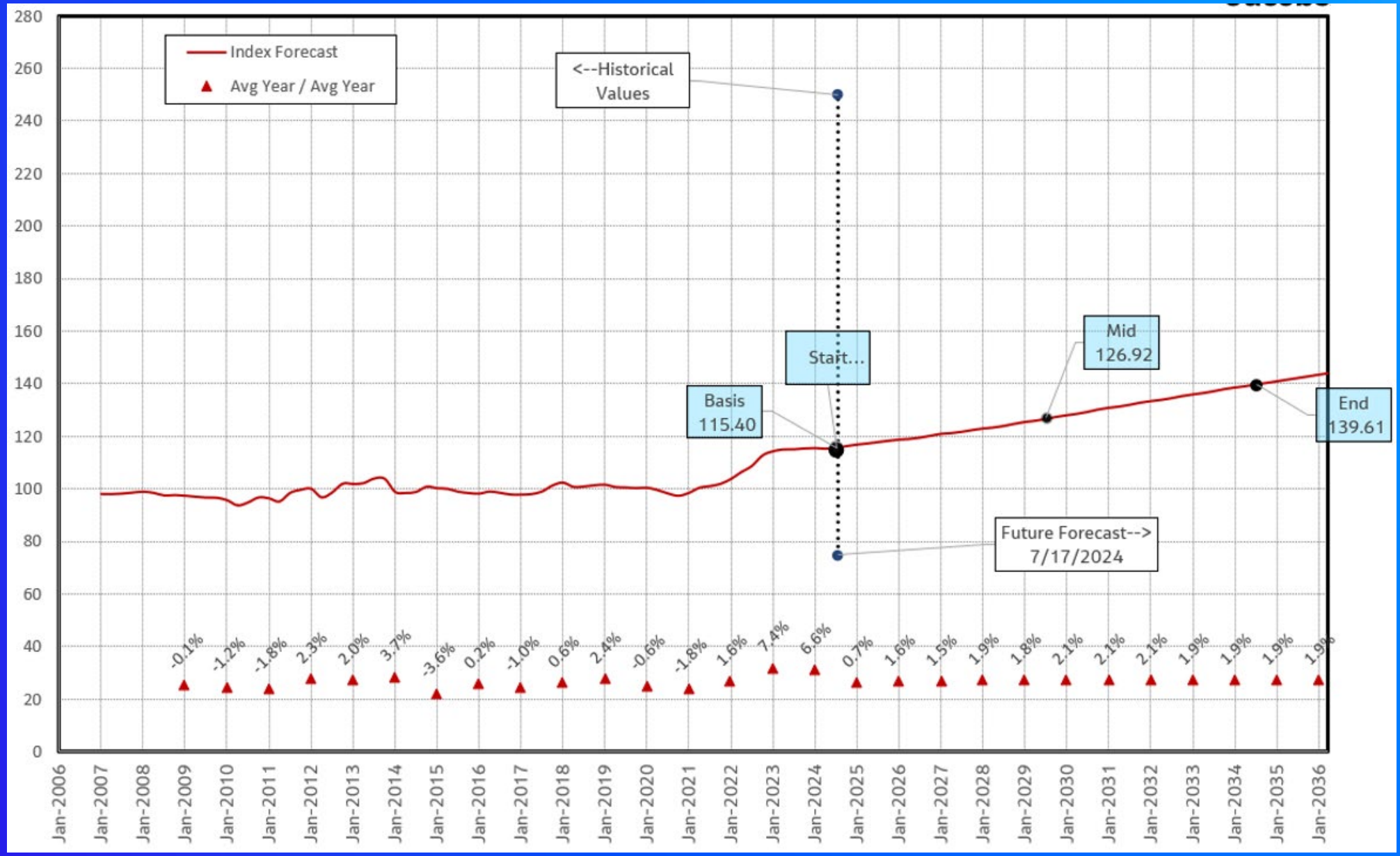
Average Annual % Change in Fuel

Source: Bureau of Labor Statistics, WPU057303 (2023)

-19%	10%	4%
percent change in last 12 months	*percent change in last 6 months*	*percent change in last month*

FUTURE (2024 TO 2026)

8%	-1%	0%
2024	2025	2026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MATERIALS

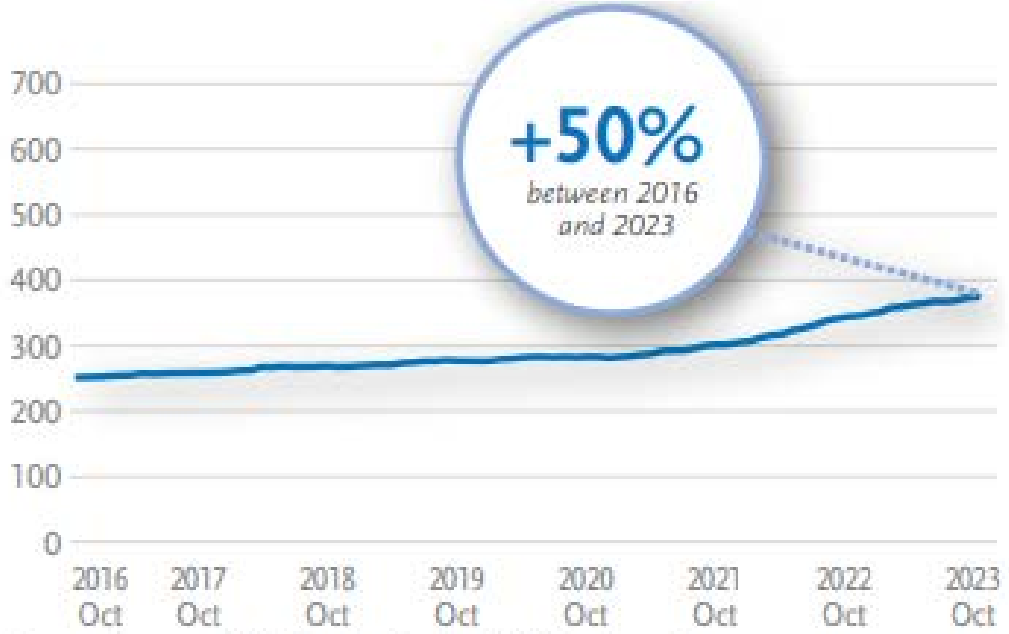
Concrete

Unlike other common materials in infrastructure construction, concrete has not seen the sharp ups and downs (refer to Figure 14). Instead, concrete has steadily increased year after year.[21] The supply of concrete materials in the U.S. is limited and imports have been slow to move.[22] For example, the years-long concrete price increases are partially due to high energy costs and the closure of a large quarry and port in Mexico causing a shortage of cement mix.[23] As a result, many contractors face severe pressure from the lack of concrete availability and high prices.

In 2024, the supply of concrete products will be limited, resulting in higher prices. Price increases beyond 2024 are anticipated to generally be around 2%, according to ENR's latest cost report.[24]

Figure 14

Average Annual % Change in Concrete



Source: Bureau of Labor Statistics, WPU133 (2023)

9% *percent change in last 12 months*

3% *percent change in last 6 months*

1% *percent change in last month*

FUTURE (2024 TO 2026)

4% 2024

2% 2025

2% 2026

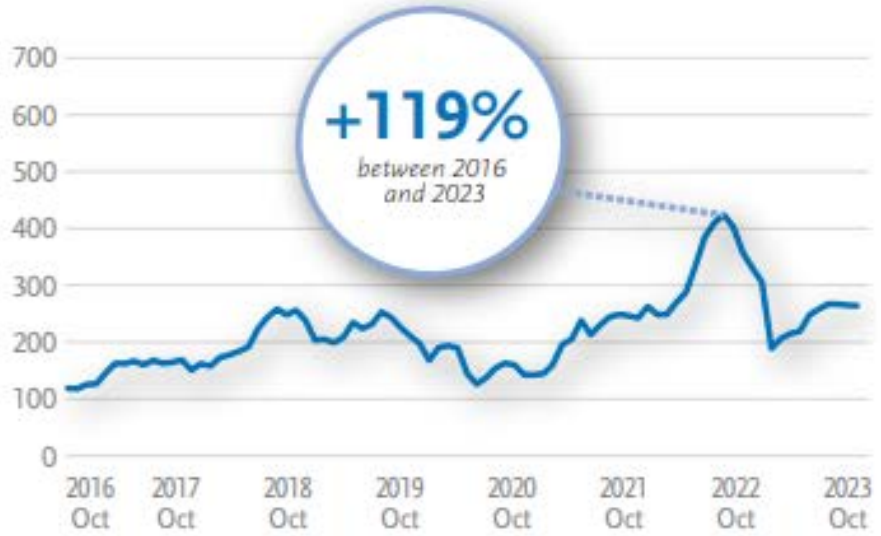
Asphalt

Historically, asphalt paving has followed oil price trends because it is made from processing crude oil. As a result, asphalt has seen its fair share of volatility over the past few years, as shown in Figure 16.

Asphalt price changes generally lag behind fuel price changes and, therefore, will likely see a short-term decline as a result of previous declines in fuel prices. However, with the current increase in fuel prices, asphalt prices will tick back up beyond 2024 per ENR's cost report.[27]

Figure 16

Average Annual % Change in Asphalt



Source: Bureau of Labor Statistics, WPU058102 (2023)

-26%	20%	0%
percent change in last 12 months	*percent change in last 6 months*	*percent change in last month*

FUTURE (2024 TO 2026)

-1%	3%	2%
2024	2025	2026

Lumber/Plywood

No other commodity has faced as much volatility as lumber/plywood over the past three years (refer to Figure 15). Producers in the U.S. and Canada cut production. However, demand for lumber/plywood experienced a quick V-shape recovery in the summer of 2020 from new housing starts and permits. This resulted in a mismatched supply and demand situation that peaked in the summer of 2021, and prices dramatically declined shortly after.[25] Prices took another sharp turn upward due to the federal government imposing tariffs on Canadian imports. In 2023, prices have steadily declined and are leveling. With the large wildfires in Canada in the summer of 2023, prices may see another upward trend.

Mortgage rates remain high and affect demand for residential construction, typically a key driver for lumber prices. As a result, lumber prices are expected to see steady prices for the foreseeable future.[26]

Figure 15

Average Annual % Change in Lumber/Plywood

Source: Bureau of Labor Statistics, WPUSI004011 (2023)

-14%	-4%	-1%
percent change in last 12 months	*percent change in last 6 months*	*percent change in last month*

FUTURE (2024 TO 2026)

1%	1%	2%
2024	2025	2026

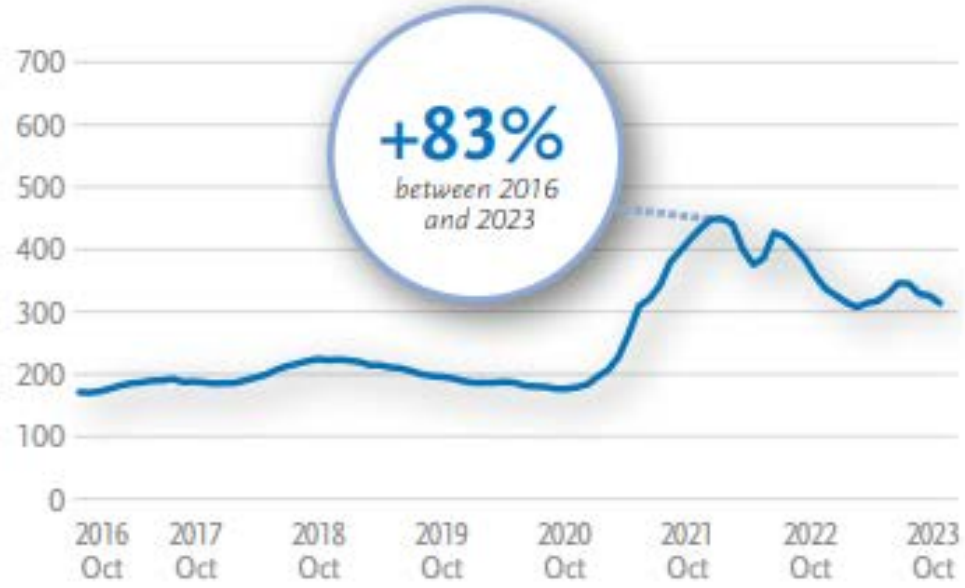
Steel

Policies enacted by the federal government over the past several years subjected imported steel to 25% tariffs. The tariffs were intended to protect some U.S. metal producers but resulted in higher prices for many domestic manufacturers that use steel. In the last three years, several of the country's largest steelmakers (US Steel and Cleveland-Cliffs) shut down some of their older mills and have continued to keep them idle because of the high cost of restarting operations. In late 2021, the steel tariffs were lifted as U.S. steel production rebounded, helping bring down prices in the past year (refer to Figure 13).

According to ENR's cost report for the third quarter of 2023, steel production costs are decreasing as mills ramp up and steel prices outside the U.S. are low. As a result, economists are anticipating that steel prices will continue to decline for the foreseeable future.

Figure 13

Average Annual % Change in Steel



Source: Bureau of Labor Statistics, WPU1017 (2023)

-12%	-1%	-4%
percent change in last 12 months	*percent change in last 6 months*	*percent change in last month*

FUTURE (2024 TO 2026)

-10%	-7%	-3%
2024	2025	2026

COMMODITY & MATERIAL ESCALATION

Commodity/Material	Actual % Change from Q1 2021 to Q1 2022	Actual % Change from Q1 2022 to Q1 2023	Actual % Change from Q1 2023 to Q1 2024	Total Change from Q1 2021 to Q1 2024
Transformers	37.4%	13.2%	5.2%	63.5%
Fabricated Structural Metal	48.7%	3.6%	3.6%	59.5%
Electrical Equipment	17.5%	11.7%	5.5%	38.4%
Concrete	8.2%	12.9%	7.6%	31.5%
Aggregates	7.4%	12.6%	7.1%	29.5%
Construction Machinery	8.1%	12.8%	4.5%	27.4%
Power Wire	26.9%	4.3%	-5.6%	24.9%
Valves Industrial	8.4%	12.1%	2.2%	24.2%
Plate Steel	72.9%	-17.6%	-12.9%	24.1%
Trucking Freight	15.1%	9.7%	-2.8%	22.7%
Fuel	60.1%	-1.0%	-22.6%	22.5%
Stainless Steel (304)	41.2%	5.6%	-26.4%	9.8%
Rebar	36.5%	-13.2%	-9.3%	7.4%
Aluminum	65.2%	-26.2%	-12.9%	6.3%
Plastic Materials and Resins	17.3%	-6.7%	-7.2%	1.5%
Electrical Bulks	34.0%	-19.0%	-6.6%	0.2%
Copper	17.7%	-10.0%	-7.6%	-2.1%
Nickel	59.4%	-7.2%	-37.3%	-7.2%
PVC	35.1%	-28.9%	-18.4%	-21.6%
Lumber	22.3%	-37.5%	-4.2%	-26.8%

IMPACTS TO BIDS/COSTS

Figure 10

Transit Megaprojects Under Construction by Metropolitan Area

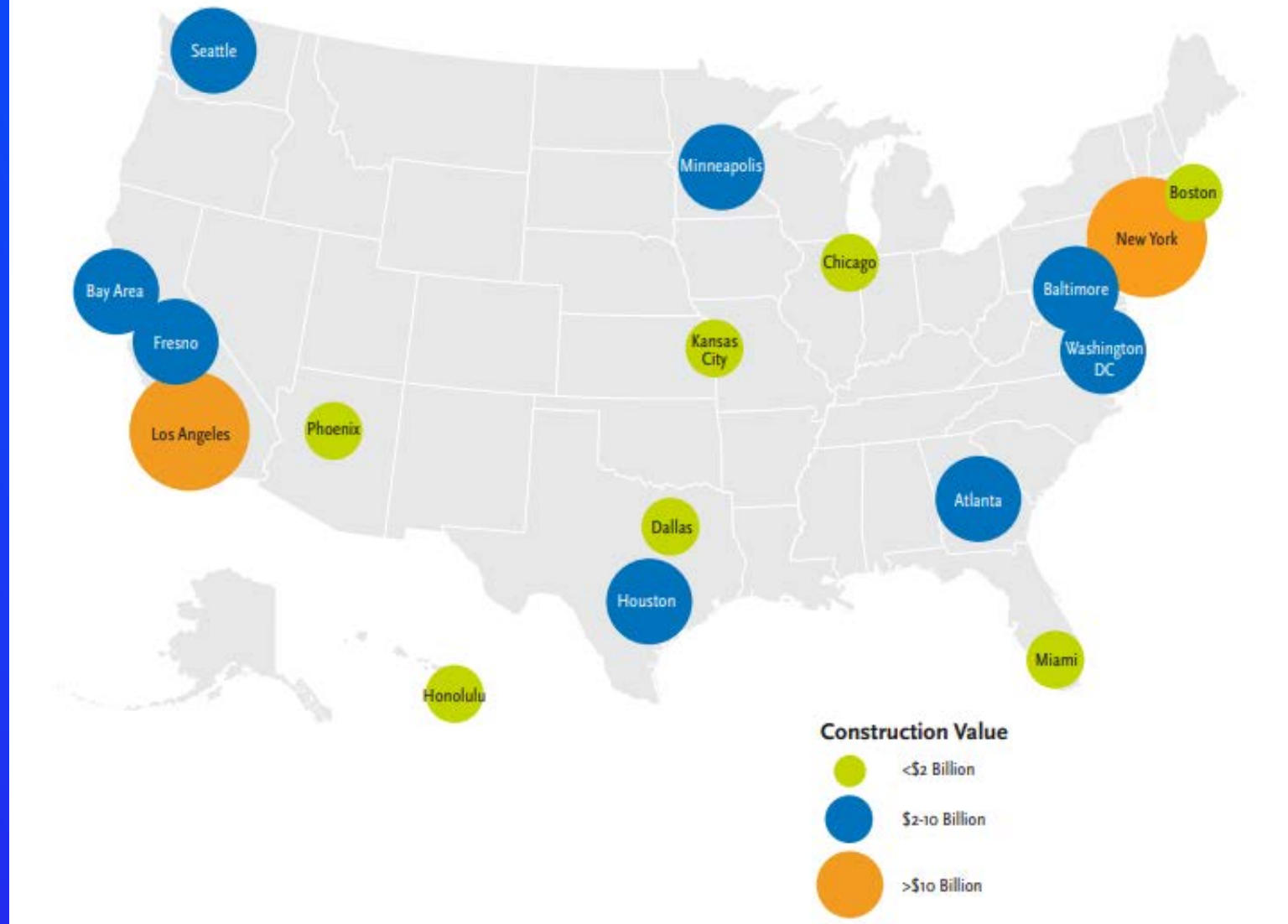
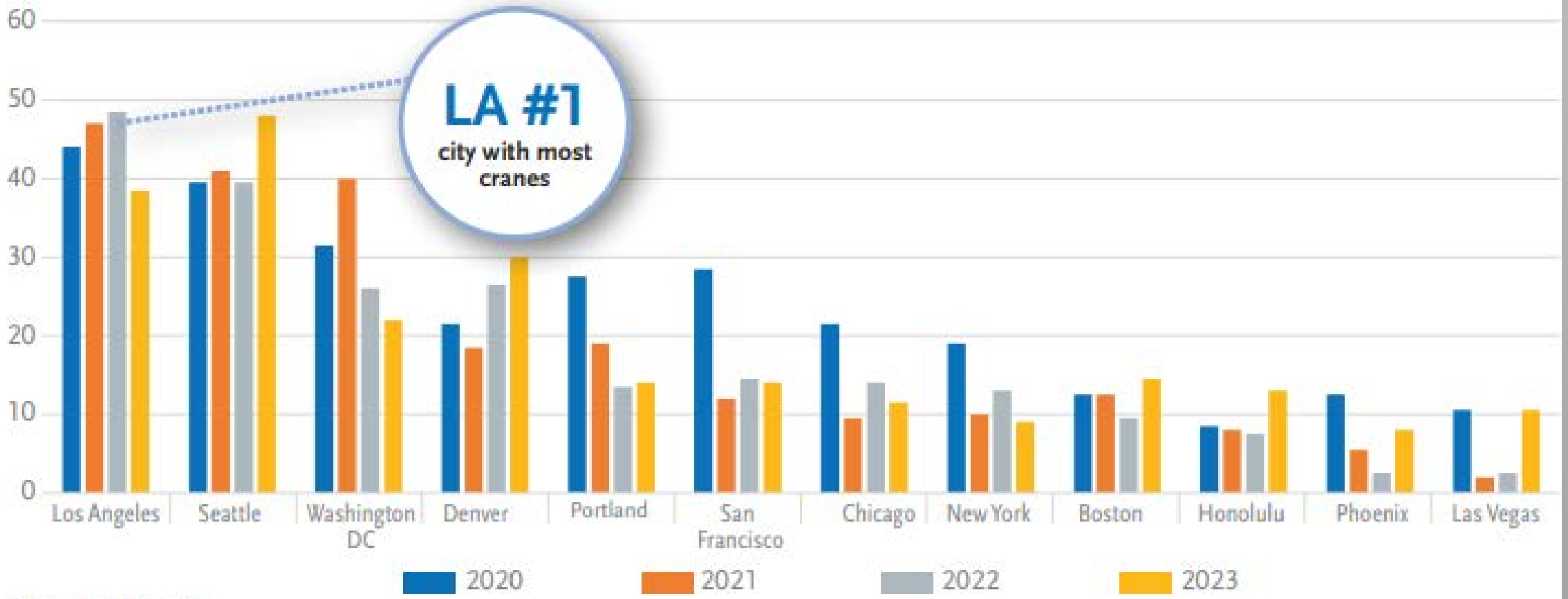


Figure 9

Annual Average Crane Count by City



Source: RLB (2023)

National Construction Costs versus Bid Pricing

Source: BLS 2023

Conclusion – “What does this mean for our cost estimates?”

- Labor escalation should continue at a steady pace that reflects collective bargaining agreements and market conditions; however, labor shortage means we need to consider a craft premium.
- Equipment rates should remain steady as long as the 2022-23 “hike” is covered.
- Materials will be a vary by commodity.
- We can have greater confidence in our estimates when the cost, risk and schedule are in alignment.

THANK YOU!

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Reinventing tomorrow.