

Research

Construction Outlook

Material and labor availability constrain recovery



Executive summary

The positive news for the construction industry this year has been the steady return of demand for projects across most sectors of commercial work. This new demand for construction, coupled with the broader economic recovery, has led to above-average increases in construction costs. Through August, average final construction costs for a commercial project had increased 4.5 percent, and total cost growth by year-end is likely to surpass 6 percent. A similar level of cost escalation, in the range of 4 to 7 percent, is expected into 2022.

Labor markets have been challenging in construction for years, and now that pain is being felt across many sectors of the economy, leading to a scarcity of available labor. As unemployment rates return to pre-pandemic levels, wage growth has kicked into high gear. The lack of available labor has led to more project delays so far in 2021 than a lack of materials, and conditions are expected to worsen over the coming year.

The volatility in construction material prices experienced this year is unprecedented in contemporary history. The increases in lumber and steel prices are by far the largest recorded through available government data back to 1949. For other commodities the records are somewhat more recent: aluminum prices have not increased this fast since 1995, plastic since 1976, copper since 2010. The inauspicious distinction this year is that all those records are being broken at the same time. Average material prices for a commercial project increased an astounding 23 percent in the 12 months prior to August 2021.



Henry D'Esposito
JLL Research Manager,
Construction

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State of the industry

Despite enduring its share of challenges over the past 18 months, the construction industry has recovered quickly by most measures. Employment is nearing pre-pandemic levels, new construction starts are growing and demand for architectural work remains strong. Yet two big challenges remain for construction. First, supply chain delays and record-high cost increases continue to put pressure on project execution and profitability. Second, the delta variant and future waves of the pandemic have the potential to slow economic growth, weakening the construction rebound and calling into question some of the rosier predictions for 2022.

Construction stats

Construction employment

- Unemployment rate:
August 2021: **4.6%**
August 2020: **7.6%**
- Total employment:
August 2021: **7.4M**
August 2020: **7.2M**

Construction costs

- Labor wages: **+4.46%** (Aug. 2020 to Aug. 2021)
- Material costs: **+23.1%** (Aug. 2020 to Aug. 2021)
- Total costs: **+4.51%** (Aug. 2020 to Aug. 2021)

Construction spending

- Nonresidential: **-9.5%** (July 2020 to July 2021)
- Residential: **+7.6%** (July 2020 to July 2021)

Sources: JLL Research, U.S. Bureau of Labor Statistics, U.S. Census Bureau

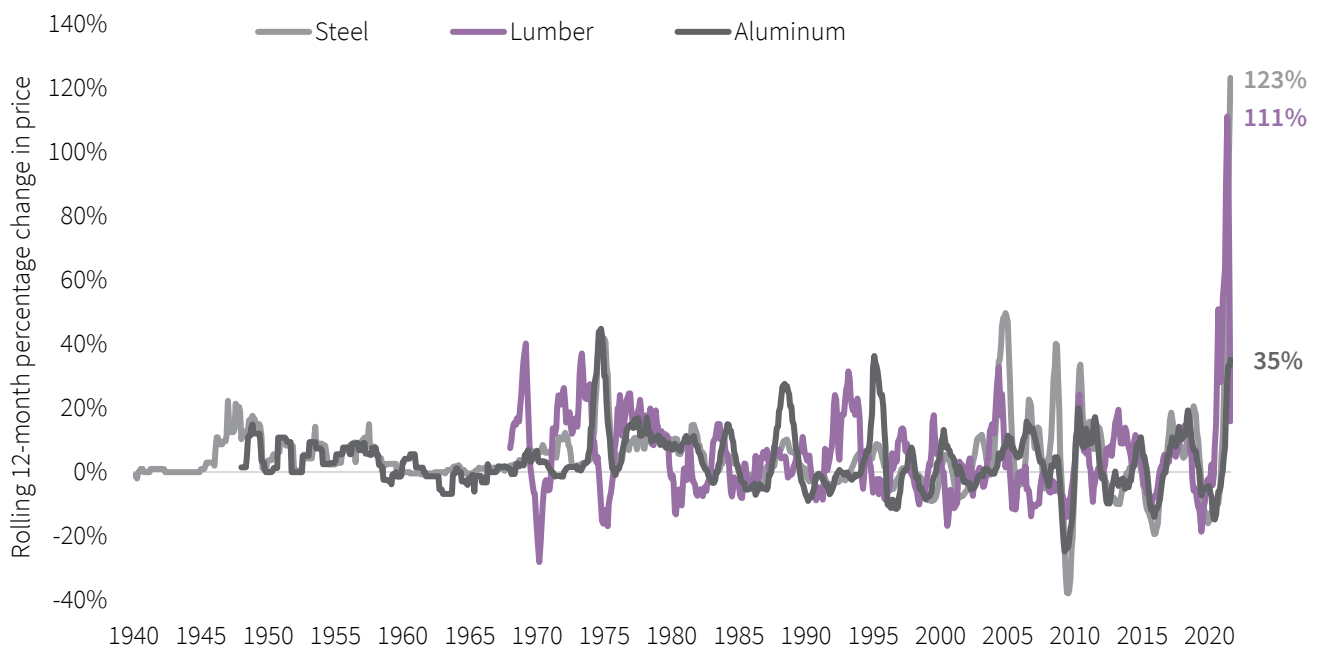


The wrong kind of history

When it comes to construction costs and supply chains, the past year has felt unprecedented, because it has been. Never in recent history have we seen so many costs rise so fast at the same time. In some cases, costs have never risen this quickly going

back decades to the start of government records. As a measurement of exactly just how unprecedented the times are, below is a historical reference point for some of 2021's key statistics.

Material cost growth since WWII



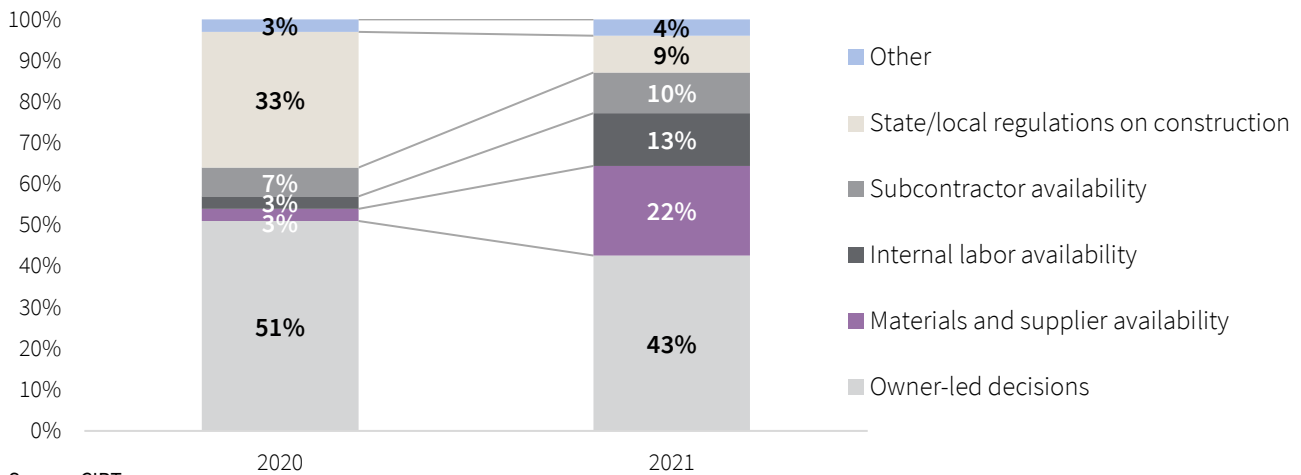
Sources: JLL Research, U.S. Bureau of Labor Statistics

Material and labor availability become primary pain point

In 2020 nearly 85 percent of project delays and cancellations were caused by either owner-led decisions or government-ordered construction shutdowns. So far in 2021, the balance has shifted toward supply issues. Material availability, internal labor availability and subcontractor labor availability have become the largest challenges for ongoing

construction projects, after owner-led decisions. Much of this shift is to be expected, as government shutdowns were limited to early 2020 and supply issues have been growing throughout the year, but it is notable that despite all of the headlines around problems with materials, both labor and materials created nearly the exact same level of delays, at 23 percent and 22 percent respectively.

Top causes of project delays and cancellations



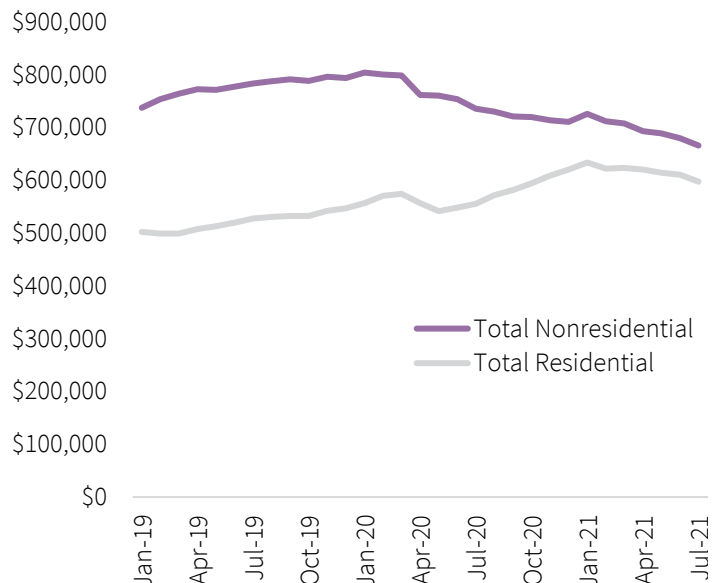
Source: CIRT

Construction spending continues slide

Both nonresidential and residential construction volume have declined over the course of 2021 on an inflation-adjusted basis. Residential remains above pre-pandemic levels thanks to a very strong 2020, while nonresidential work has declined steadily since the pandemic. Other indicators such as Architectural Billings suggest demand for new construction work is strong, but growing demand for new projects has not yet eclipsed the effects of 25 percent fewer new project starts back in 2020. At some point over the next 12 months, this trend is expected to stabilize and reverse itself, and nonresidential construction will return to month-over-month growth. Based on the latest data available for new project starts that have occurred this year, overall construction volume is expected to begin growing in the spring of 2022.

U.S. construction spending

Monthly U.S. construction spending (inflation adjusted, seasonally adjusted annual rate, millions)



Sources: JLL Research, U.S. Census Bureau

Key forecasts from the H2 2021 Construction Outlook

1.

Total construction costs:

The year ahead will look much like the year so far, as moving forward we will grapple with similar supply chain challenges, potential new waves of coronavirus infections globally and labor shortages at home. The net effect will be another above-average year of total construction cost growth, forecast to increase 4–7 percent over the next 12 months.

2.

Construction labor costs:

The construction labor market has mostly recovered from the pandemic, and falling unemployment rates over the last six months have coincided with a steep increase in wages. Looking ahead to the next year, construction labor costs will continue to grow at a similar elevated rate to the last six months, with wage increases in the 3 to 6 percent range expected.

3.

Construction material costs:

Production challenges across the world and bottlenecks throughout supply chains will continue causing delays and headaches. At the same time, prices for some commodities including metals are not likely to continue increasing endlessly, and we

should see relief in a few categories over the next year. Material costs are the lowest-confidence forecast due to the wide range of inputs and global supply chains bucketed into a single category. The net impact will be a wide range of price changes for individual materials, with an average increase across all materials in the 5 to 11 percent range expected.

4.

Construction volume:

Inflation-adjusted nonresidential construction spending has declined consistently since the pandemic began, driven downward by fewer new project starts in 2020. Spending is beginning to level out, but the combination of the delta variant and typically slower winter months means that any true rebound is unlikely until spring or summer 2022.

5.

Political implications:

As of this writing, the fate of major public spending on infrastructure still hangs in the balance of Senate negotiations. Any major spending will funnel large amounts of money toward construction, but a smaller portion will directly impact commercial work, rather than true infrastructure. If the infrastructure bill passes, much of the spending, and therefore the cost impacts, will occur in years 2 to 6 after passage rather than right away.

Construction cost analysis



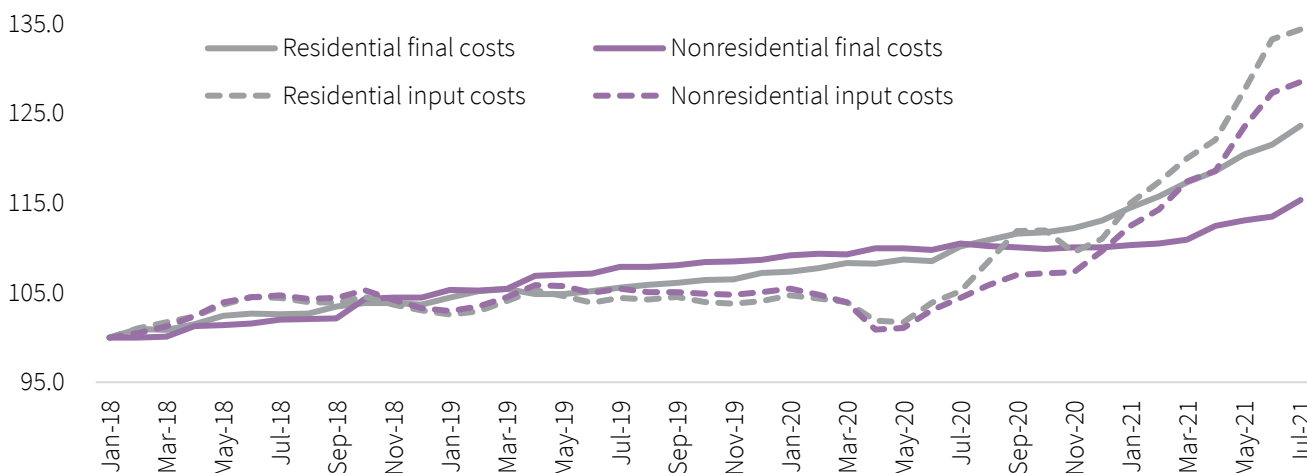
Total construction cost update

The chart below may be the single best description of construction costs both in 2021 and ahead into 2022. It represents the change in construction material costs compared to the change in the total cost of a project. The first set of lines in gray represent construction costs for residential projects, while the second set of lines in purple represent construction costs for nonresidential buildings.

This chart illustrates one of the most interesting trends of 2021: the unprecedented growth in material input prices and the significant degree to which these costs have not yet been passed through to final bid prices. This is especially true for nonresidential work, where relatively weak demand compared to residential has held down the costs that can be passed on to final clients. The data also shows how residential costs, both input and final, have increased faster than nonresidential costs. We can see that the latest data from July shows the start of a slowdown in the pace of material cost increases, which can largely be attributed to lumber.

Construction costs: Input vs. Final by building type

Construction cost index (index value 100 = Jan. 2018)



Sources: JLL Research, U.S. Bureau of Labor Statistics

What does this mean for construction costs over the next 12 months? As outlined in the two sections that follow, we are expecting to see above-average increases in costs of both construction wages and construction materials over the coming year. The combination of continued economic reopening in the U.S. mixed with global disruptions due to the continuing pandemic are setting up another year of cost challenges. The additional factor, as depicted in the chart above, is that most of the material cost increases from the past 12 months have not even been passed through to final nonresidential bid prices yet. As demand for new projects continue to grow and contractor backlogs fill, there will be less incentive to bid aggressively, and contractors will aim to pass through cost increases to the owners as soon as the market can bear it. This combination of factors leads us to extend our forecasts for 4.5 to 7.5 percent final cost growth for nonresidential construction in calendar year 2021 and to forecast a similar 4 to 7 percent cost growth range for 2022.

Construction cost analysis

2. *Construction material update*

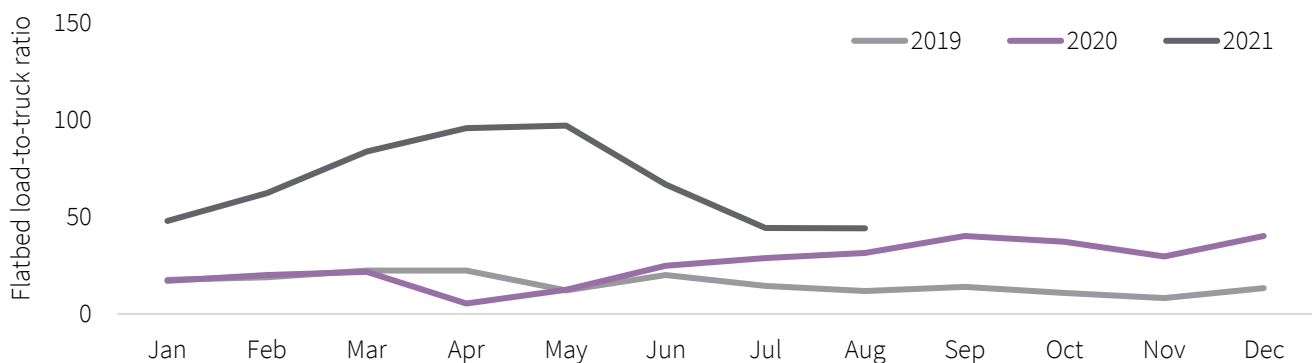
Materials have been the headline-grabbing sector of the construction industry this year, and with good reason given the enormous swings in lumber and steel prices. While the last 12 months have seen major volatility, we expect the coming year will be somewhat more stable, but that stability will bring broad-based inflation across almost all construction materials. The challenge last year was managing around lumber prices that were up three times in as many months, but the challenge moving forward will be managing a project budget with all materials increasing 5 to 10 percent.

Aside from costs, the most pressing issue for most construction materials right now is lead times and delays. Hopes for major relief during 2021 have been largely dashed, with hope for a return to normal now pushed out into 2022. The root cause of the issue moving forward is in some ways more straightforward than in 2020, when misplaced expectations led to lower production and surprisingly high demand. Today, the speed of economic recovery in the U.S. and most other developed countries is not catching anyone by surprise, but instead persistent backlogs combined with a new round of production and shipping

shutdowns globally due to the delta variant have meant that suppliers are unable to catch up despite their best attempts to do so. There have been some early signs of relief on the domestic front, as illustrated in the chart below, which essentially conveys the running backlog for domestic truck shipments. Global shipping is still experiencing major delays, with high costs and delays expected to persist well into next year.

As has been the case for the past few years, geopolitics will also play an outside role in construction materials cost and availability. While many of the tariffs set by the Trump administration have remained in place under President Biden, the most pressing development may be the recent coup d'état in Guinea. The small West African country is one of the world's largest exporters of bauxite, the ore used to produce aluminum. The instability in Guinea caused aluminum prices, which were already rising but had avoided the wild swings of steel, to jump to a 13-year high. In a few months' time the situation in Guinea may stabilize, but it is an example of construction's continued exposure to risk from global forces even beyond the pandemic.



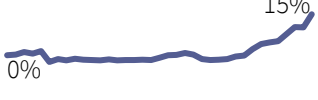






Domestic flatbed truck demand



Source: DAT Freight and Analytics

Construction material cost and volatility data

The table below analyzes the recent cost history of nine major types of construction materials over the past decade. The materials are ranked by historical cost volatility over the past 30 years, with the least volatile materials at the top and the most volatile at the bottom. Although forecasts for any particular month or year may swing, measuring differences in volatility is key to developing an accurate forecast and a project budget that correctly accounts for potential cost risk.

	Volatility rank (1 = most volatile)	Material	Quick chart (3-yr.)	10-yr. avg. change	3-yr. avg. change	1-yr. avg. change
Low volatility	9	Flat glass		+2.7%	+3.0%	+7.1%
	8	Concrete		+3.5%	+3.8%	+6.0%
	7	Insulation materials		+3.7%	+4.8%	+17.2%
	6	Plastic construction products		+4.1%	+9.9%	+29.6%
Medium volatility	5	Aluminum mill products		+2.1%	+4.8%	+35.1%
	4	Steel mill products		+6.1%	+21.3%	+123.1%
	3	Lumber and plywood		+6.4%	+10.2%	+15.9%
High volatility	2	Gypsum products		+6.9%	+4.0%	+22.9%
	1	Copper and brass products		+2.3%	+15.8%	+45.3%

Source for all charts: U.S. Bureau of Labor Statistics Producer Price Index

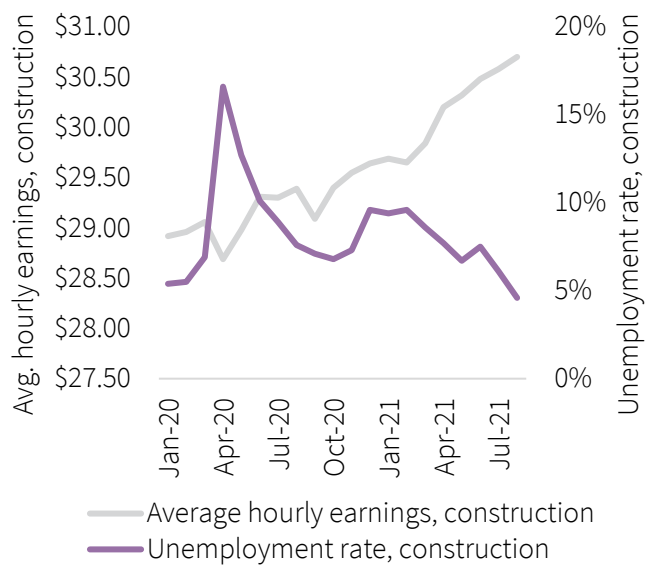
Construction cost analysis

3. Construction labor update

A decade of labor challenges

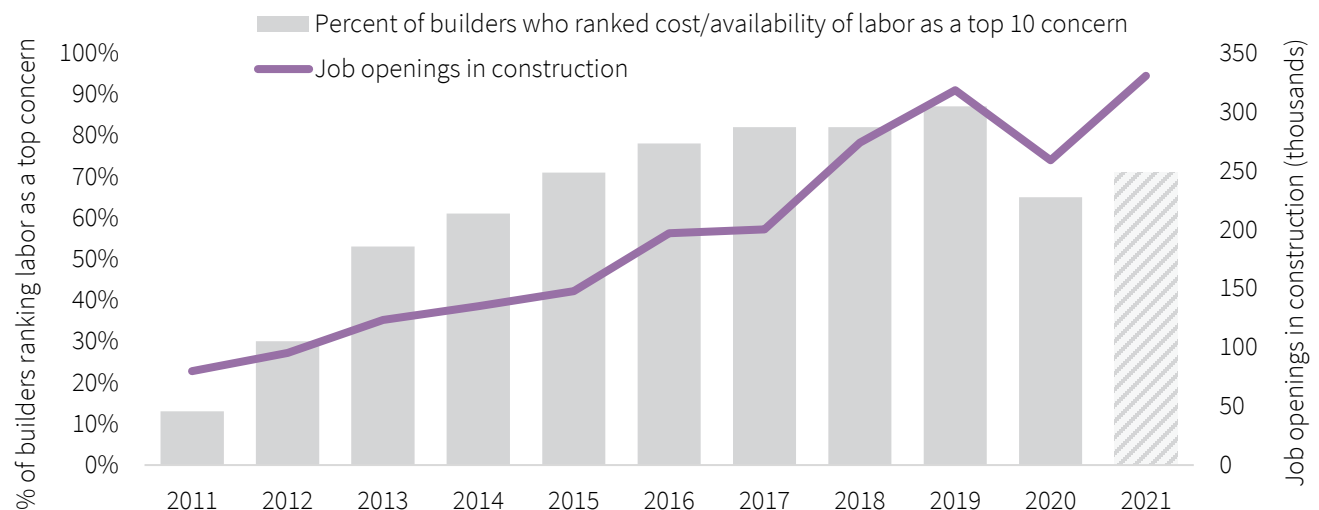
This year, discussions of a labor shortage spread beyond just construction and across many industries, with companies from retailers to manufacturers reporting challenges with hiring and retaining enough workers to meet increased demand for their goods and services. For anyone in construction that story is a decade in the making. Reports of a labor shortage in construction picked up in the growth period after the great recession and grew into a full-blown crisis by the middle of the decade. With increasing demand for workers came more jobs sitting open, and the need to get projects staffed up to avoid delays led to ever-increasing wages. From 2015 to 2019, the number of open and unfilled jobs in construction across the country doubled from 150,000 to 300,000 openings. In 2017, 2018 and 2019, over 80 percent of construction firms ranked the cost and availability of labor as a top concern.

U.S. construction employment



Sources: JLL Research, U.S. Bureau of Labor Statistics

The construction labor shortage



Source: JLL Research, Bureau of Labor Statistics, NAHB

Construction was one of the fastest sectors to recover from the pandemic—but a major risk endures

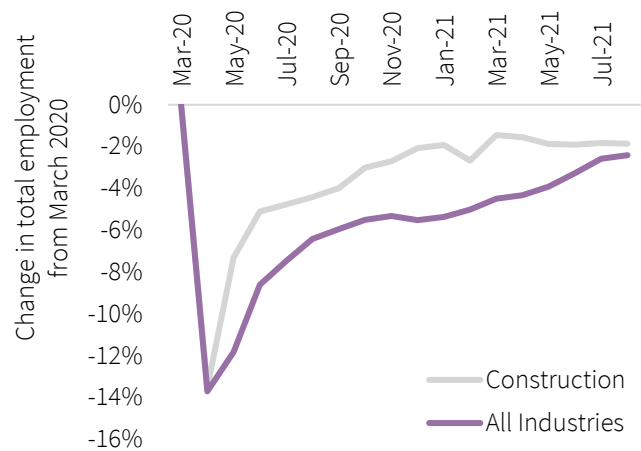
The pandemic brought shutdowns and delays, which led to over a million construction workers being laid off. The massive layoffs in March and April 2020 have mostly receded, and although construction was relatively hard-hit during the early waves of the pandemic, it has recovered more quickly and more strongly than the economy overall.

Despite strong demand and a much faster employment recovery than the rest of the economy, construction labor gains have leveled off over the last six months. Construction has yet to regain pre-pandemic levels and is returning to an average level closer in line with the rest of the economy.

An additional concern is how at-risk the construction labor force is to additional variants of COVID-19 going forward. Construction has the lowest vaccination rate, and the highest vaccine hesitancy rate, of any major industry. While the delta variant is the primary concern at the time of this writing, the risk for additional pandemic waves caused by variants over the coming winter remains a major concern. The construction industry has gained experience managing through the pandemic

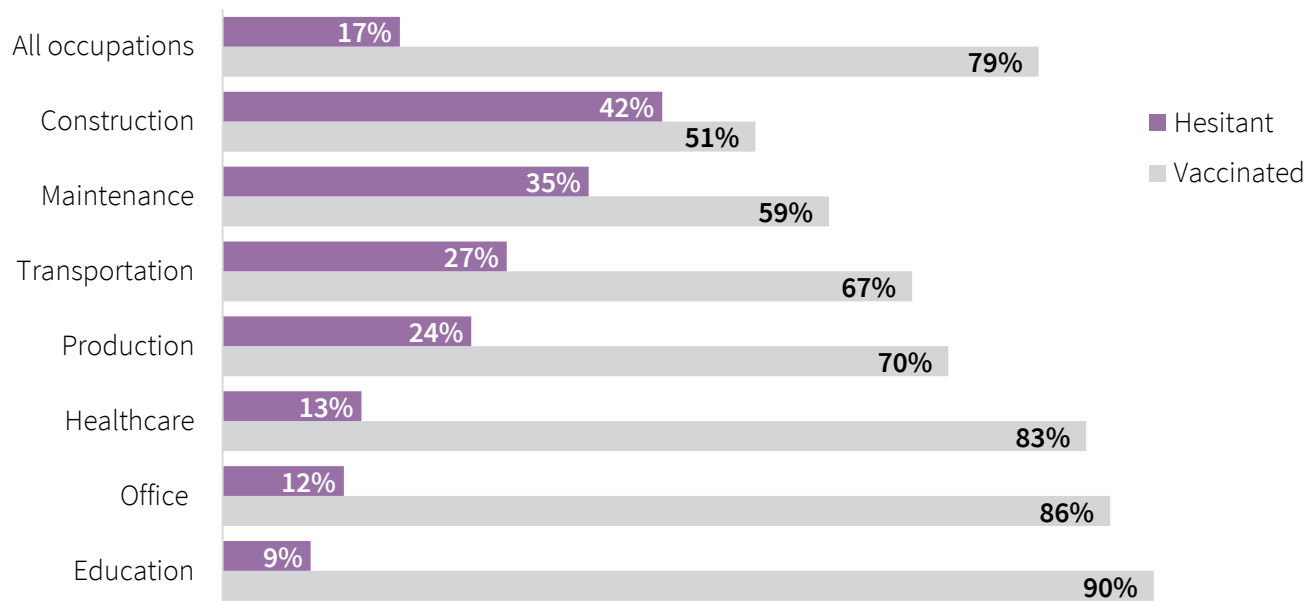
but is also at increased risk of disruption due to relatively low rates of vaccination. This means greater risk of outbreaks on job sites, greater risk of employees contracting severe complications and a bumpier road back toward a return to pre-pandemic operations. The chart at the bottom of the page shows construction compared to other industries, with nearly 30 percent lower vaccination rates and more than double the rate of vaccine hesitancy compared to all U.S. occupations.

Employment recovery: Construction vs. All industries



Source: Carnegie Mellon University

Vaccination rates and hesitancy by industry, May 2021



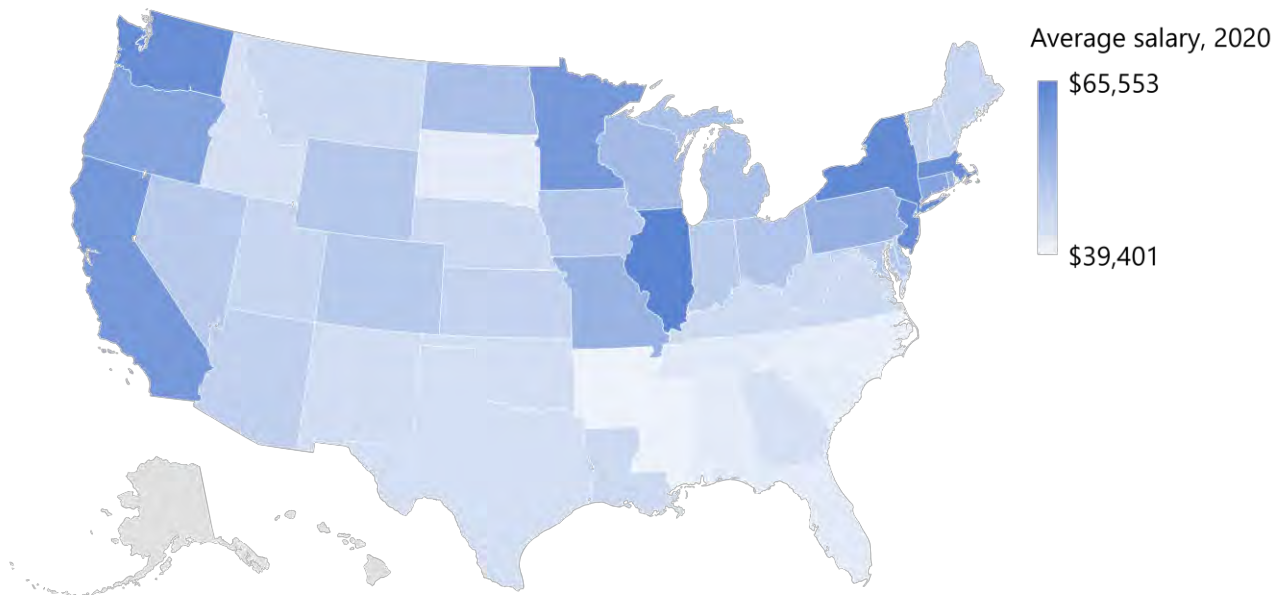
Source: Carnegie Mellon University

Geography of construction wages across the U.S.

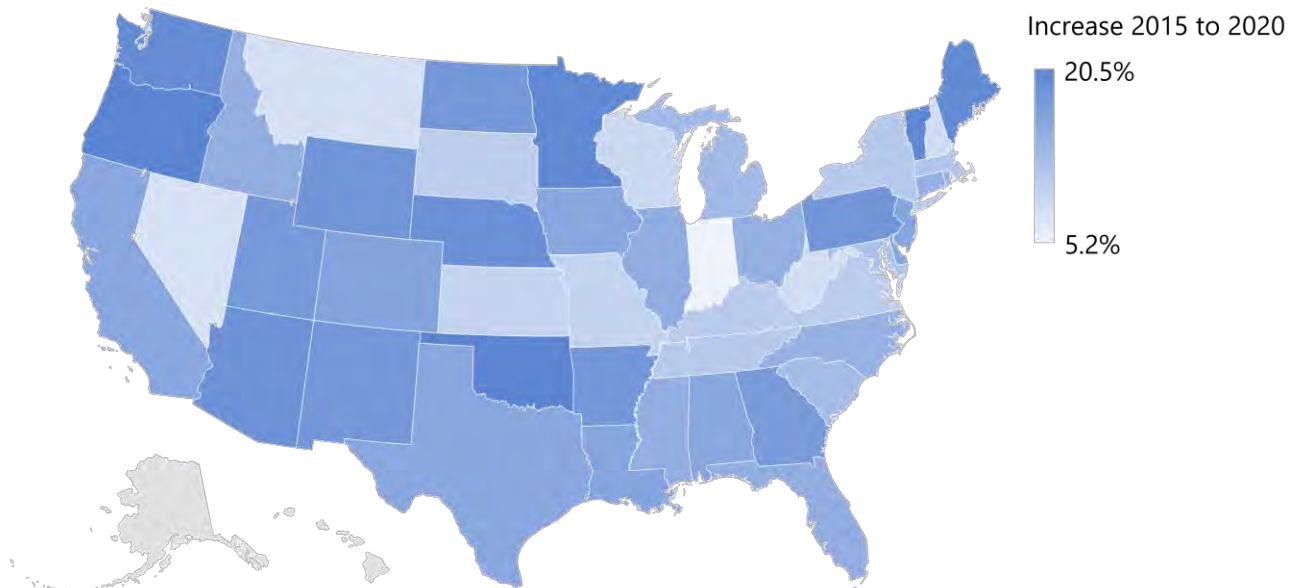
The maps below add a geographic perspective to discussion of construction labor. At top, the map shows each state weighted by the average annual salary of workers in the construction industry. This generally lines up with salary trends in other industries, with high-wage states clustered in the Northeast corridor and the West Coast. The Midwest is also a high-cost region, with Illinois standing out as the top state, while the entire Southeast is the cheapest area of the country.

The second chart provides more insight. It measures change in construction wages from 2015 to 2020. What stands out here is that many of the lower-wage states appear to be catching up. Wage growth across the country is much more evenly distributed, and some of the top states in total wages, including Illinois, New York and California, are only in the middle of the pack.

Average construction salary, 2020



Change in average construction salary, 2015 to 2020



Sources: JLL Research, U.S. Bureau of Labor Statistics

Grading our previous construction forecasts

How have our forecasts from the last Construction Outlook held up?

In our previous report, the [H1 2021 JLL Construction Outlook](#), we laid out five key forecasts. Each of those five forecasts is reviewed and assessed below.

Total construction costs | Grade: **Near target**

Original forecast: “Every year from 2012 to 2019 recorded between 3.5 to 5.5 percent cost inflation across U.S. construction. For the full year, 2021 will bounce back to be within that range, and may even approach the higher end of it.”

Assessment: Over the past 12 months, average commercial construction costs in the U.S. have increased by 4.5 percent, which is directly in line with our forecast range so far. However, most of the cost growth occurred in 2021 and not 2020. Year-to-date, costs are up 3.4 percent. On an annual basis, we are tracking to the higher end of our forecast, although we may end up at 6–7 percent, largely due to material costs growth, exceeding our forecast maximum of 5.5 percent.

Construction labor costs | Grade: **On target**

Original forecast: “Construction labor cost growth will continue in 2021, with labor costs expected to increase in the range of 2–5 percent.”

Assessment: Construction wages are up 4.5 percent over the past 12 months, again falling within our forecast range. Wage growth has been more consistent over the past year than total cost growth, and as a result we are on track to close out the calendar year in the 4 to 5 percent growth range, hitting the upper end of our 2021 forecast.

Construction material costs | Grade: **Off target**

Original forecast: “Construction material costs will increase in the range of 4–6 percent throughout 2021. Volatility was exceptionally high in 2020 due to shocks from the pandemic and will remain elevated in 2021.”

Assessment: Although our volatility forecast was correct, construction material cost growth is on track to dramatically outpace our 4 to 6 percent growth forecast for 2021. Average material prices are up 17.2 percent year-to-date and up 23 percent over the past 12 months. Although this growth rate is expected to slow, especially given that lumber price declines are only just beginning to be factored into government-tracked materials data, total increases for the year will still far exceed our forecast.

Construction volume | Grade: **On target**

Original forecast: “Nonresidential construction spending will decline between 5 and 8 percent for 2021 but will begin to increase month-over-month in the third or fourth quarter, returning the industry to growth in 2022.”

Assessment: Nonresidential construction is down 6.3 percent year to date in 2021 when adjusting for inflation and down 9.5 percent on a 12-month basis. Given that we saw the greatest declines early in the year, and we expected the pace of declines to slow and level off as we reach the end of the year, spending is on track to close out the year near the top of our 5–8 percent decline range.

Political implications | Grade: **On target**

Original forecast: “The political impacts of the Biden administration will be wide-ranging and are likely to evolve but, considering what we know now, are likely to have the aggregate impact of further increasing construction costs.”

Assessment: As of this writing neither the infrastructure package nor the larger \$3.5 billion spending bill proposed by Democrats had passed, but both appear likely to move forward in some form. The large volume of spending in the infrastructure bill that will be directed toward construction over the next five years is expected to contribute to higher construction costs.



Contact Research:

Henry D'Esposito

Construction Research Lead

Americas Research

+1 202 697 0640

henry.desposito@am.jll.com

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