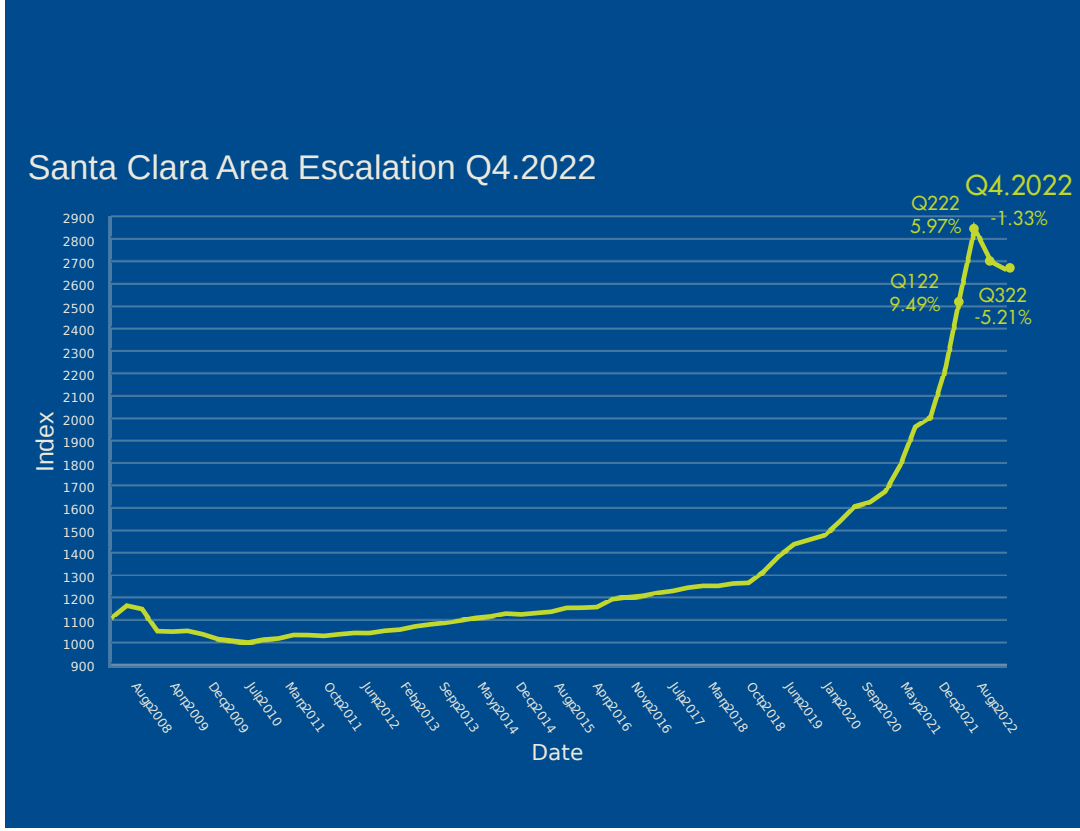
2022 Q4

THE LOOK AHEAD

Market Overview

The Federal Reserve's rate hikes began to temper inflation in 2022's fourth quarter, but the economy continues to put up strong numbers due to tightness in the labor market. Discipline is the key word heading into 2023—discipline to hold rising interest rates to assure inflation is halted. In this issue, we dive into the national strategy our mission critical team is employing to deal with resource challenges across the country. We also examine how consumer spending, the housing market, and the steep increase in grocery prices are impacting the economy, particularly construction.



THE SANTA CLARA MARKET

Silicon Valley trade partners reported a tightening market for new construction projects in the fourth quarter of 2022, with increasing competition and decreasing average project sizes. Project cancellations have been driving down backlogs.

Mechanical, electrical, and architectural retrofits are keeping contractors busy in the short term. No companies report laying off any of their core labor, although the civil and structural trades in particular are eyeing the slowdown in building starts with concern. Commodity prices are generally continuing to decrease, although a countercurrent of inflation in other sectors is keeping actual delivered costs steady. Increases in manufactured equipment prices have slowed over the last quarter. Lead times, especially for electrical equipment, remain a challenge to construction schedules.

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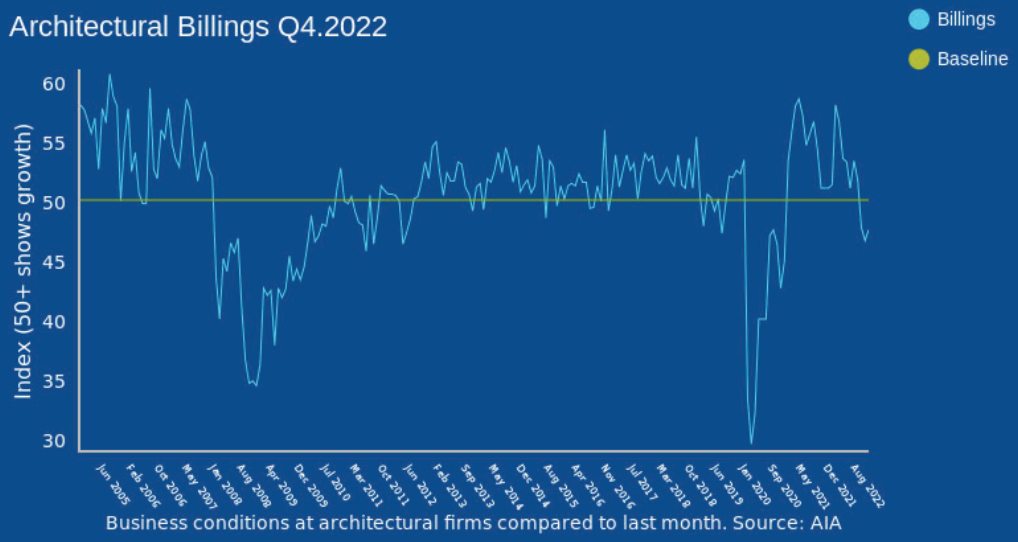
LABOR & MATERIAL TRENDS THIS QUARTER			
Labor Wage Change		**Material Price Change**	
Carpenter	0.00%	Fabricated Steel	-5.40%
Laborer	0.00%	Fabricated Copper	5.65%
Sheet Metal Worker	0.00%	Fabricated Aluminum	5.00%
Plumber/Fitter	0.00%	#2 Diesel Fuel	-8.08%
Electrician	0.00%	4,000 psi Concrete Ready Mix	-0.38%
Bricklayer	0.00%	Lumber, FOB Jobsite	-24.56%
Iron Worker	0.00%	Glass	3.70%
Glazier	0.00%	Sheet Metal	-0.91%
Roofer	0.00%	Gypsum	-13.65%
Operator	0.00%	Other Materials	1.21%
Other Materials consists of brick, block, precast insulation, floor covering, ceilings, and Miscellaneous materials			

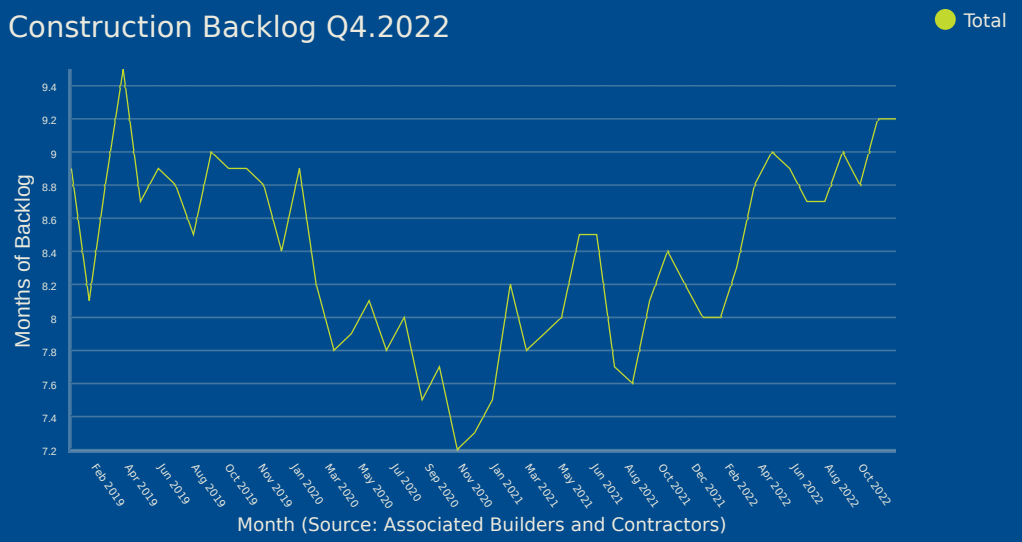
NATIONAL CONSTRUCTION INDICATORS ACTIVITY & PRICING METRICS

Architectural Billings Q4.2022



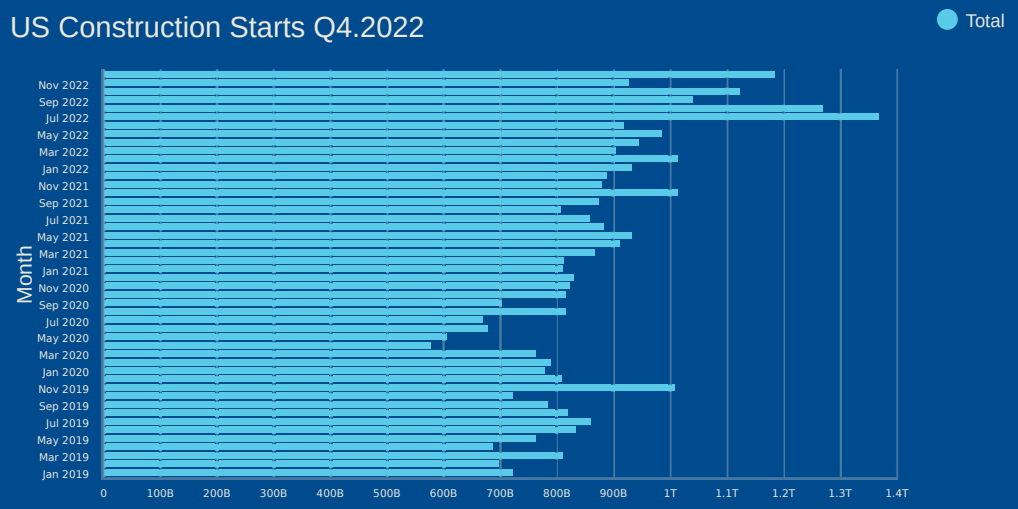
Business conditions at architectural firms compared to last month. Source: AIA

Construction Backlog Q4.2022



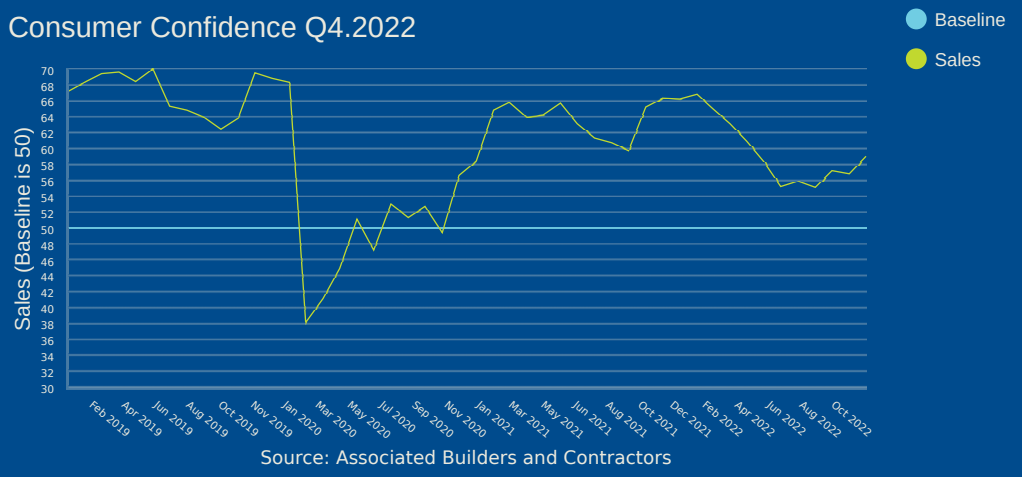
Month (Source: Associated Builders and Contractors)

US Construction Starts Q4.2022



Dollars (Source: Dodge Data & Analytics)

Consumer Confidence Q4.2022



Source: Associated Builders and Contractors

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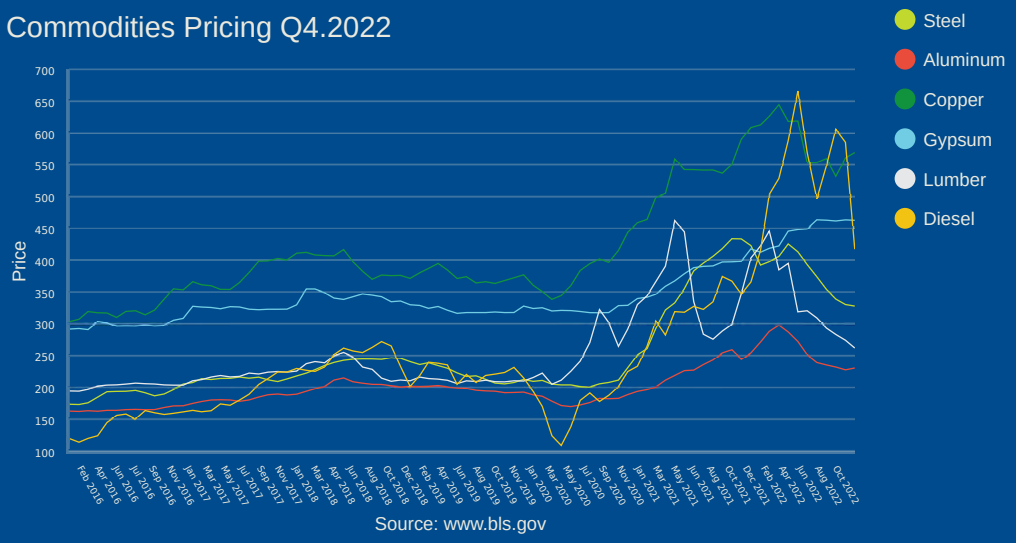
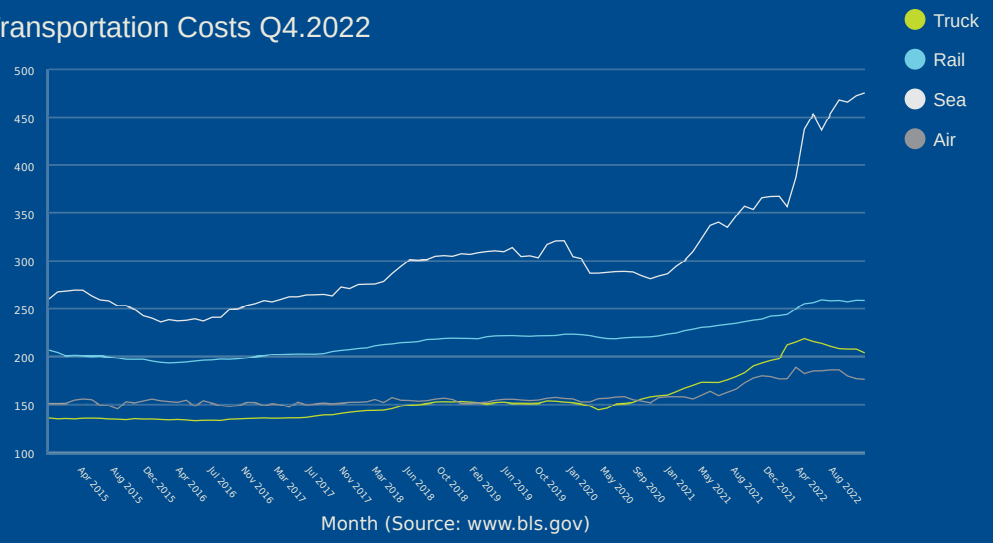
NATIONAL CONSTRUCTION INDICATORS ACTIVITY & PRICING METRICS

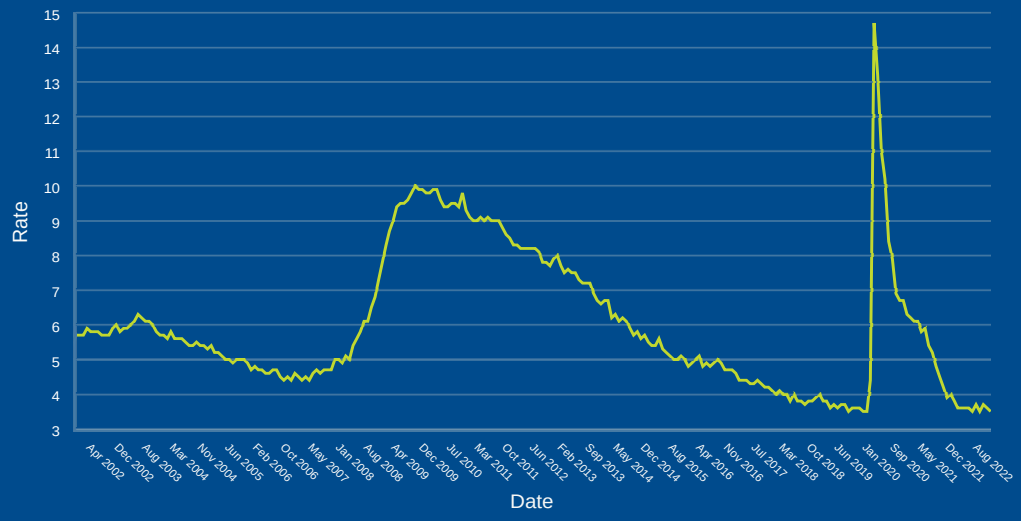
Commodities Pricing Q4.2022



Transportation Costs Q4.2022



Unemployment Rate (Source: BLS.gov)



FUTURE ISSUES

As feedback and market-specific questions have been posed, we are always enhancing the depth and type of information The Look Ahead features. Please click here to send your comments and requests.

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MISSION CRITICAL SPOTLIGHT

For the past five years, the construction industry, specifically data centers, has seen a huge uptick in $1B+ "mega" projects across the United States. The need for high-speed access to information, the growing number of users through mobile devices, and the dependency on technology across all industries was driving the demand even before the COVID-19 pandemic.

More recently, the construction of these projects has been complicated by the compounding supply chain and labor shortage issues, pressing our teams to refine old processes and get creative with new ones to meet the demands of these large-scale efforts while staying on schedule and on budget. The data center industry is one that has been tasked with building simultaneous mega projects under some of the tightest speed-to-market conditions.

In this Spotlight, Brian Pung, Preconstruction Director for JE Dunn's mission critical team, explains what makes data centers unique, the trends steering the industry, and what we are doing to remain flexible to adapt to the known and unknown challenges on the horizon.

The terms "mission critical" and "data center" are often interchangeable. Mission critical refers to the 24/7, no downtime requirement of the business while data center is typically the physical location that houses the hardware needed to support mission critical services. Data center owners are generally confidential with strict protocols.

TERM	MEANING
IoT	Internet of Things. network of physical objects that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the Internet.
Latency	The time it takes for computer data to be processed over a network connection
Enterprise	A private data center facility or space dedicated to one company.
Co-Location	Data center space for companies who want to host their hardware and servers off site.
Hyperscale	Like enterprise, they are owned and operated by the company they support, but have large scale infrastructure offering at least 40MW of capacity. These are the mega projects this industry is seeing.

GROWTH

One of the key characteristics of a mission critical construction project is the required speed to market. Once demand or lease dates are triggered, we are typically required to have the facility powered and ready within 12-16 months. Couple this with the fact that the data center market is currently doubling in size year after year, and you can easily see how crucial it is to employ a coordinated and collaborative approach.

The primary reasons behind this growth are the combination of cloud computing and machine learning (work from home and online training), edge computing (data sits between hard-wired network and cloud, low latency is crucial), an E-commerce retail spike, remote learning, IoT / 5G mobile consuming exponentially more data, and an increased need for cloud storage.

In the first half of 2022, more than 1,600 MW (megawatts) were under construction. That number was more than twice what was produced in 2021. At JE Dunn Construction, we had 306 MW under construction in 2022 and we will have 536 MW under construction in 2023. The global data center market increased by 22% (an increase of $616B) between 2021 and 2022, with 35% of that in North America.[1]

SIZE	EQUIVALENT/FACTS
Kilowatt	1000 watts
Megawatt	1,000,000 watts 1,600 MW of U.S. data center construction in 2022 900 homes powered for a year
Gigawatt	1000 watts 100 million LED lights 1.3 million horses
Terawatt	1 trillion watts The U.S. uses 4,146.2 Terawatt hours of electricity a year.

ENERGY

One such restraint is the energy required to power these facilities. The mechanical and electrical components of data centers typically account for approximately 60-70% of the total construction cost of a data center. When adding in the value of owner-furnished equipment and costs of new substations to energize the site, this percentage can grow to

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70%-80% of the overall project value. Strains to our nation's power grid not only pose potential issues for some of these mega projects, but they also create concerns about power availability, which is a factor in our clients' site selection process. While many regions have vast plots of land and offer development and economic incentives to attract hyperscalers, we are seeing that in many cases power companies are at capacity and cannot meet the energization dates clients need. In one example, space has been leased for a facility whose construction completion is five years out. The front-end planning is a monumental effort to ensure every base has been covered and budgets in excess of a billion dollars are maximized.

SUPPLY CHAIN

You can't discuss resources and trends and ignore supply chain issues. In recent years, switchgear (used to distribute and protect the electrical load) lead times have increased from 26 to 86 weeks while generator lead times have increased from 30 weeks to over 90 weeks! The one thing that is consistent throughout the construction industry is an understanding that everyone should plan for a fractured supply chain through mid-2024.

JE Dunn is using multiple strategies to address these issues. With the delays discussed here, the earlier we can identify long lead equipment and materials with the owner and designer, the better. JE Dunn has a team of engineers devoted to tracking and monitoring long-lead equipment regardless of whether the owner or GC holds the contract. By setting up these dedicated teams, we can identify and release the equipment earlier and modify the design documents to accommodate material equipment that has already been released. In addition, this team helps track and identify any potential delays in the manufacturing process to bring them to light and minimize any resulting cost and schedule impacts. Doing this also helps us not only provide certainty of outcome when it comes to schedule, but also helps eliminate costs from creeping up due to inflation.

In addition, we are seeing owners negotiate and bulk purchase major equipment direct from manufacturers at a program level even prior to site selection. When allowed to work with vendors on a national program level, compared to a site level, owners have better purchasing power and can better pivot their needs based upon immediate demands. When you have an owner who starts up multiple hyperscale campuses annually, the time and money savings realized with this strategy are monumental.

WORK FORCE

Just as owners must look at available energy during site selection, the available labor force to build and staff the facility has also become a factor. We've discussed the labor shortage in previous articles, and the construction industry had 388,000 open jobs as of November 2022. This is a shortage we anticipate for at least the next decade. In response, we have clients shifting to new markets with lower demand for resources and lower land costs such as Omaha, Neb. or Boise, Idaho.

Another strategy that can ease workforce challenges is to prefabricate as much as possible. Prefabrication is nothing new, but it does require extensive early coordination. On such large-scale projects, the efficiencies gained can provide significant relief to the labor shortage. Prefabrication does not make sense for all scopes on a project, however there are big advantages to a project if key labor hours can be shifted offsite. We have experienced successful projects in which we have shifted more than 50% of electrician and pipe-fitter hours offsite by modifying the design to implement a skidded electrical room approach as well as prefabricated electrical feeder/pipe distribution systems. This combined approach helps reduce the peak workforce curve, which in turn leads to a faster construction schedule, reduced safety incidents, and increased quality.

We are also addressing staff shortages by teaming with minority business partners. In teaming with diverse partners, the goal is to bring new talent to mission critical and an opportunity to increase their technical and operational capacity in mission critical construction and ultimately create capacity in the industry. In addition, we're encouraging our suppliers, manufacturers, and distributors to include diverse partners in pricing to build capacity in all facets of the industry.

RESPONSIVE PARTNERSHIP

Proactive and collective partnership between all stakeholders is the foundation of success for these projects.

One of our clients recently said, "The challenges being presented by supply chains, be it lead times, constrained resources or pricing changes, have all necessitated the need to step back and look at the bigger picture and then define a strategy to minimize the impacts of current market dynamics. That in itself is only one aspect, you have to keep running those assessments. More importantly, you need to maintain dialogue with your partners and work together to maintain the right strategies to meet the needs of our business."

It's no small task to secure large sites, amass the skilled staff to build these facilities, accelerate the schedules, put up millions of square feet of structure, and keep it all quiet at the same time. We have found that by applying national strategies and sharing resources instead of just looking at each individual project's potential hurdles, we've helped all our teams across the U.S. meet the demands of these fast-paced mega projects and scaling requirements of the owners.

Sources: 1) prnewswire.com

CONSUMER SPENDING

In previous issues of The Look Ahead, we took an in-depth look at how The Federal Reserve uses interest rates to control inflation and the cause and effect between the labor shortage and extended periods of inflation. In construction, the supply chain and escalation are still the primary issues affecting project success.

To understand the current juxtaposition of price inflation in the midst of slowing, but positive, GDP growth and historically low unemployment numbers, it helps to understand where these discrepancies originated and how our everyday personal expenses impact the overall economy.

PERSONAL CONSUMPTION

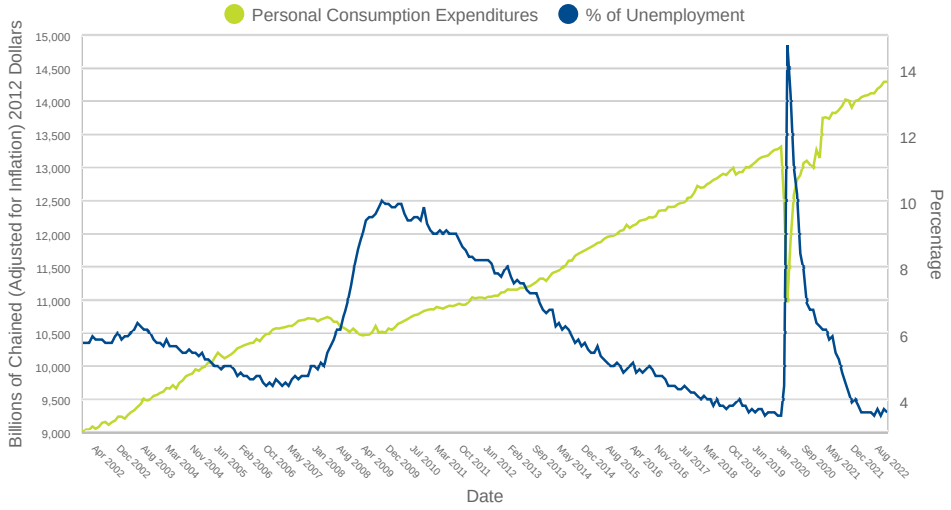
Consumer spending or Personal Consumption Expenditures (PCE) make up 70% of our economy, so what Americans are spending their money on is extremely important to the direction of the economy.

This consumption includes all purchases made by consumers, such as food, housing, energy, clothing, health, leisure, education, communication, transportation, travel, and dining out. It is estimated that the national average amount spent is somewhere around $60k/year or just over $5k each month. The vast majority of that gets spent on five things: housing, transportation, food, utilities and taxes.

RELATIONSHIP TO UNEMPLOYMENT

Traditionally, unemployment moves inversely with PCE as shown in the chart below.

In 2023, we should see reigned-in spending as unemployment rises due to measures aimed at reducing inflation.



But why is spending still so high when inflation is so high? Right now, consumers have approximately $930 billion in excess savings; that is the amount saved above the normal, pre-pandemic savings rate. This savings was accumulated during the pandemic through stimulus money and sheltering in place. As of October 2022, consumers had spent only 25% of these excess savings.[1]

TIME FRAME

This balance-sheet excess has enabled consumers to spend at an elevated rate even as the Federal Reserve tries to squeeze demand out of the economy—exacerbating the need for a more severe and longer-lasting rate hiking cycle. However, inflation continues to take a bite out of purchasing power, shrinking the effect of all those extra dollars in peoples' wallets. Consumers have a cushion, but that cushion won't last forever. Estimates show that this excess savings will last until roughly the second half of 2023. As these excess savings run out, inflation will subside not only in the personal consumption retail market, but also across commodities heavily utilized in the construction industry.

Sources: 1) federalreserve.gov

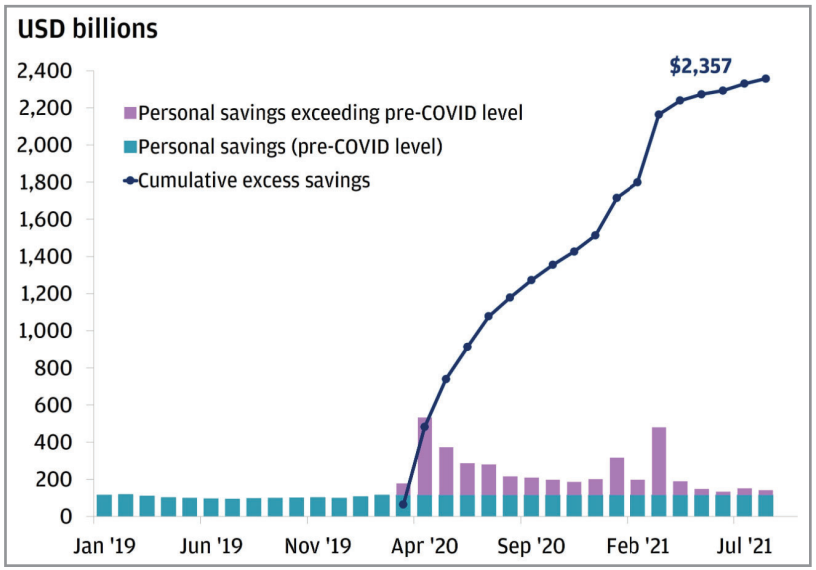


Chart Courtesy of Chase.com

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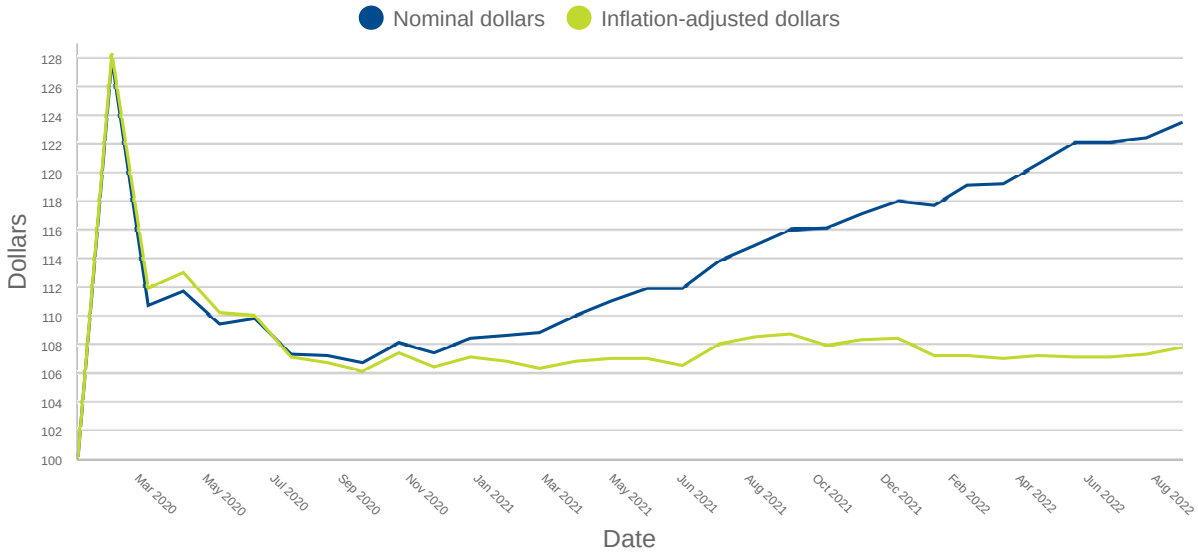

U.S. Consumer Spending on Groceries, Changes Since Feb 2020 (Source: FRED)

GROCERIES

According to the Bureau of Labor Statistics, one of the items seeing an above average rate of inflation is food. People are spending more dollars on groceries today than they were pre-pandemic, but they are buying fewer groceries. In real terms (dollars minus inflation), they are spending a great deal less and being fiscally conservative. Consumers are also saving by substituting, buying the store brand over the national brand, but even with that change, the practical effect is still less-full pantries overall.

CUTTING BACK

According to research from *Forbes*, over half of respondents—51%—say they are buying fewer non-essential groceries, and 39% are buying fewer groceries altogether. Some 46% of respondents are using leftovers more often in an attempt to reduce food waste. Meanwhile, 49% are cooking more meals at home instead of ordering takeout, and 62% say they are dining out less frequently.

Even with these measures consumers still must spend on essentials, and we chose to highlight groceries because some of those items are getting hit with higher inflation than what is being measured by the overall level. For instance, a grocery cart of chicken, soda, toilet paper, bread, milk, coffee, cereal, rice, pasta, butter, apples, and bananas costs 14% more in October 2022 compared to a year earlier, whereas the overall inflation number is less than 8% year over year.

TAMING OVERALL INFLATION

Many economic principles show direct relationships. When one factor increases, another decreases, and so on. The cost of food is one area where a negative impact on individual consumers may actually have a positive impact on the overall economy.

As consumers deplete their excess post-pandemic savings resources, they will be forced to spend less in the overall economy, thus driving down consumer spending and helping tame inflation.

This is a prime example of real world daily purchasing habits that have direct impact on U.S. inflationary values that extend both to general retail and our construction industry.

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HOUSING

Housing, or shelter, is a large part of what makes up the Consumer Price Index (CPI), accounting for 30% of the total value.

Measuring it properly can be very tricky. Because the CPI focuses on consumption, it considers housing as a service that people use, as opposed to an investment good, and only incorporates the price of that service into the index. Unfortunately, the price of shelter services for homeowners is hard to measure because the price cannot simply be read off a price tag. The price must be estimated, and there is no single best way. The current measure uses market rents, which assumes renters and owners face similar price dynamics. In addition, rents often change on an annual schedule, which can result in the well-documented lag between the CPI measure and price indexes for houses and rental units.

IMPACT ON MONTHLY BUDGET

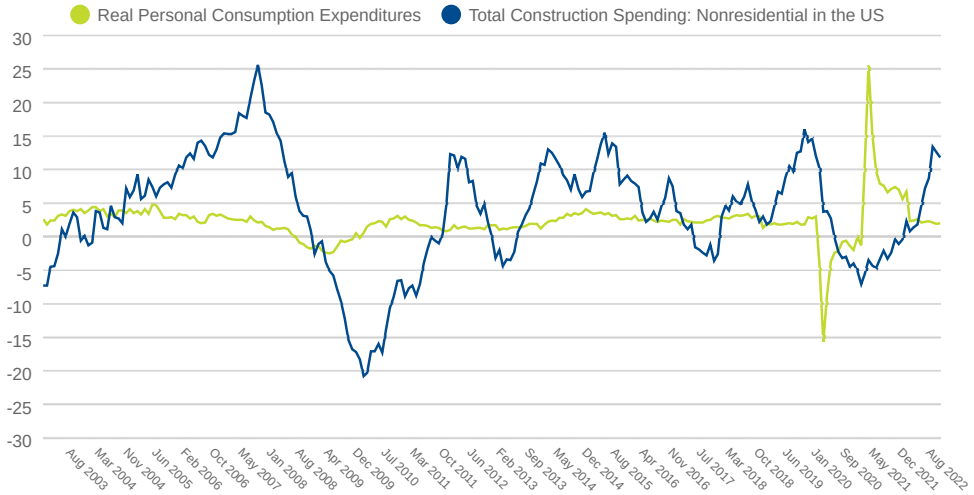
Despite these challenges, the CPI can still be useful for getting a sense of how prices have changed for housing. The cost of shelter has increased 7% year over year. While that isn't the biggest percentage change that we'll look at, it is being applied to the largest expenditure that consumers face—roughly 21% of the total monthly budget on average. As a result, we recently saw a contraction in residential investment.

RELATIONSHIP TO CONSTRUCTION

What do these consumer indicators mean for commercial construction? While not directly tied, there is some degree of correlation between construction spending and consumer spending. As previously mentioned, consumer spending makes up a very large part of our economy and as spending goes up—increasing GDP—we often see a rise in construction spending. In fact, when the quarterly gain in spending is greater than 2% year over year, typically construction spending often sees percentage gains more than double consumer spending gains.

So what's driving this relationship? In this case, it is likely that a rising tide lifts all boats; when consumer spending increases, it signals an aggregate increase in demand across other sectors, even nonresidential construction. When consumer spending decreases, we often see a pullback in demand across those sectors as well. If businesses are a main driver for construction starts and the overall level of demand for businesses is determined by consumers, that means when consumers aren't demanding as much, the business won't need the new office building or infrastructure or factory, etc.

Increases in consumer spending are almost always a boon for the construction industry. However, just like an overgrown forest can benefit from occasional fires clearing out the underbrush and debris, the construction industry can benefit in the long-term from a cooled-off labor market and price resetting, improving their ability to hire and retain workers and ultimately offer a better product.



Nonresidential construction activity is moderately correlated with consumer spending. Though construction activity is much more volatile, a tendency exists for consumer spending to slightly lead nonresidential construction activity. This is evident as businesses tend to need more factories, offices, capacity etc. when people are buying more of their things or using more of their services.

2023 OUTLOOK

Since we launched The Look Ahead in 1Q2022, we have received valuable feedback and a lot of questions about the future of our economy. As our internal teams keep close tabs on economic fluctuations, material pricing, and the national supply chain, we wanted to offer some thoughts on the direction we think our economy could go in 2023.

RATES

We believe the Federal Reserve will raise the Federal Funds rate .25% in February and at least another .25% at the end of March. Members of the FOMC have indicated that the terminal Federal Funds rate will still not have been reached with those two hikes. If that proves to be the case, then the economy won't reach a sufficiently suppressive state to drive inflation down fast enough, and up to another .50% in hikes will be required. This would leave the rest of 2023 between 5.25% and 5.50%.

GROSS DOMESTIC PRODUCT

Given those operations, we see real Gross Domestic Product (GDP) growth staying in positive territory for 4Q22 but falling into negative growth for the first half of 2023. It may cross back into the positive by the second half of the year.

CONSUMER SPENDING

Consumer spending will likely stay elevated for the first part of 2023 and will be what keeps inflation from coming down at the pace we need. With heightened spending, the labor market stays tighter for longer, sustaining inflation. Once the lag from Fed hikes finally works through the system, and consumers run out of cash, spending will fall and wage growth will slow—especially on the services side. The labor market would likely then loosen, and unemployment could rise somewhere in excess of 5%, though not likely above 6%. This will cause inflation to subside and come within sight of the Fed's target rate of 2%. We don't think reaching 2% this year is possible, but we should get below 4%, which would be a welcome change.

CONSTRUCTION

For construction, we see the effects of the slowdown as planned jobs reduce due to higher interest rates and lower spending in general. We expect costs to moderate as well but not enough to fully prop demand back up. Most of the effects on construction should come in the back half of the year. Overall, we anticipate the impact will be milder than the last two recessions (Pandemic & Great Recession), and the industry will likely enter back into the expansionary portion of the cycle sometime in late 2024.

MARKET-BY-MARKET

Additionally, here are some predictions for specific construction markets. Demand for new retail will be negatively impacted by a decline in spending. New housing supply (single and multi-family) will see some relief with the pandemic backlog and will impact rent and vacancy by driving down rates as more units become available. While bringing workers back into the office boosts that demand, loosening the labor market will mean less workers on payroll and fewer cubicles needed. Chip manufacturing is seeing some cooling for the most cutting-edge products, but older tech is still in high demand. We foresee some of that demand waning by the end of 2023 thanks to a pullback in consumer spending. Hospitals and schools are typically not directly impacted by retail spending and will therefore be more resilient to the effects of a cooling economy.

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