

Build Beyond Today

The Construction Economy Outlook

Spring Webcast

May 9th, 2023

2:00 p.m. ET to 3:30 p.m.
ET



In Partnership with



Paul Hart

VP, Product Marketing
Building Product Manufacturers



Spring 2023 Economic Webcast

Agenda

- 1 Kermit Baker, AIA
- 2 Ken Simonson, AGC
- 3 Kristy O'Brien, ConstructConnect
- 4 Alex Carrick, ConstructConnect
- 5 Michael Guckes, ConstructConnect

- Interact with the presenters anytime! Submit questions throughout today's webcast through the question feature available in the on-screen panel.
- An on-demand version will be provided via email within 72 hours of the event.
- The recording of this webcast will also be posted on our Economic Resources page.
- Quarterly Construction Starts and Put in Place Forecasts available:

www.constructconnect.com/economic-resources

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LEARNING OBJECTIVES

- Understand how global and domestic economic conditions can impact architects & designers, contractors, engineers, construction managers, and building product manufacturers.
- Understand changes in inputs to construction, focusing on potential labor market challenges and material cost pressures that may arise from broader economic pressures.
- Understand business risks and opportunities based on forecasts for all segments of U.S. construction activity.
- Determine, based on economic presentations and discussions, which building categories and geographies should expect growth—and which should prepare for downturns.

This program is registered with the AIA/CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product. Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

The background features a blue gradient with various data visualization elements. In the upper right, there is a bar chart with a white line graph overlaid, showing an upward trend. A data point on the line is labeled '6342'. In the lower right, several blue arrows of varying sizes point upwards and to the right, suggesting growth and progress. The overall aesthetic is clean and professional, typical of a corporate or industry resource page.

Economic Resources

constructconnect.com/economic-resources

Kermit Baker

Ph.D., Hon. AIA
Chief Economist,
American Institute of Architects



After Declining in 2021, Construction Spending on Buildings Made a Healthy Recovery Last Year...



Billions of \$, Jan.–Dec. 2022 vs. Jan.–Dec. 2021 totals

	2022	2021	% Change
Total Nonresidential Building Construction	\$600.7	\$546.9	9.8%
Commercial/ Industrial	\$326.9	\$278.3	17.5%
Lodging	\$18.6	\$18.2	1.8%
Office	\$87.2	\$86.6	0.7%
Commercial (retail & other)	\$114.8	\$94.6	21.4%
Manufacturing	\$106.4	\$78.9	34.8%
Institutional	\$273.8	\$268.6	1.9%
Healthcare	\$52.6	\$48.5	8.5%
Education	\$99.0	\$98.5	0.6%
Religious	\$2.9	\$2.9	-1.9%
Public Safety	\$11.2	\$12.2	-7.4%
Amusement & Recreation	\$27.0	\$25.3	6.8%
Transportation	\$56.8	\$56.7	0.2%
Communication	\$24.3	\$24.7	-1.4%

Source: U.S. Census Bureau, Value of Construction Put in Place

...and That Recovery Has Even Strengthened With the Q1 2023 Readings



Billions of \$, Jan.–Mar. 2023 vs. Jan.–Mar. 2022 totals

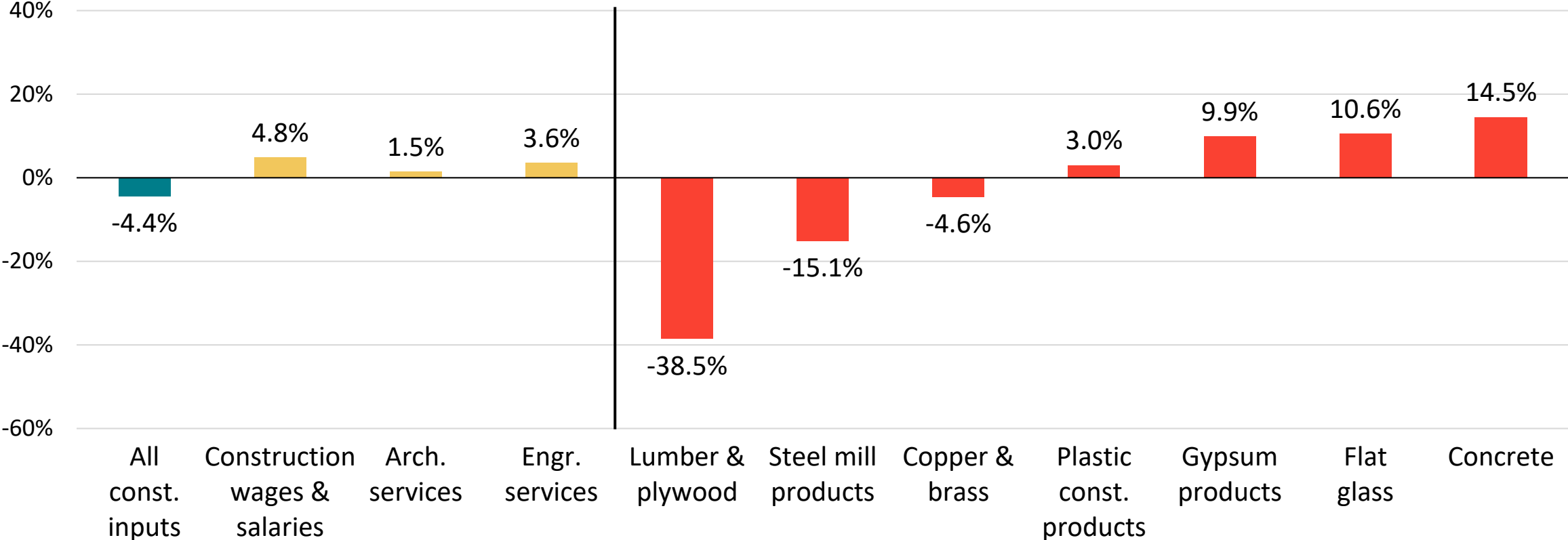
	2023	2022	% Change
Total Nonresidential Building Construction	\$157.1	\$128.5	22.3%
Commercial/ Industrial	\$91.5	\$69.3	32.0%
Lodging	\$5.4	\$3.9	38.8%
Office	\$22.8	\$19.7	15.4%
Commercial (retail & other)	\$29.2	\$24.1	21.6%
Manufacturing	\$34.1	\$21.6	57.5%
Institutional	\$65.7	\$59.2	11.0%
Healthcare	\$13.3	\$11.8	12.6%
Education	\$23.2	\$21.0	10.5%
Religious	\$0.7	\$0.7	7.2%
Public Safety	\$2.6	\$2.4	8.6%
Amusement & Recreation	\$6.7	\$5.9	13.4%
Transportation	\$13.5	\$12.0	12.7%
Communication	\$5.7	\$5.5	4.5%

Source: U.S. Census Bureau, Value of Construction Put in Place

Construction Costs for Key Commodities Continue To Be Very Volatile



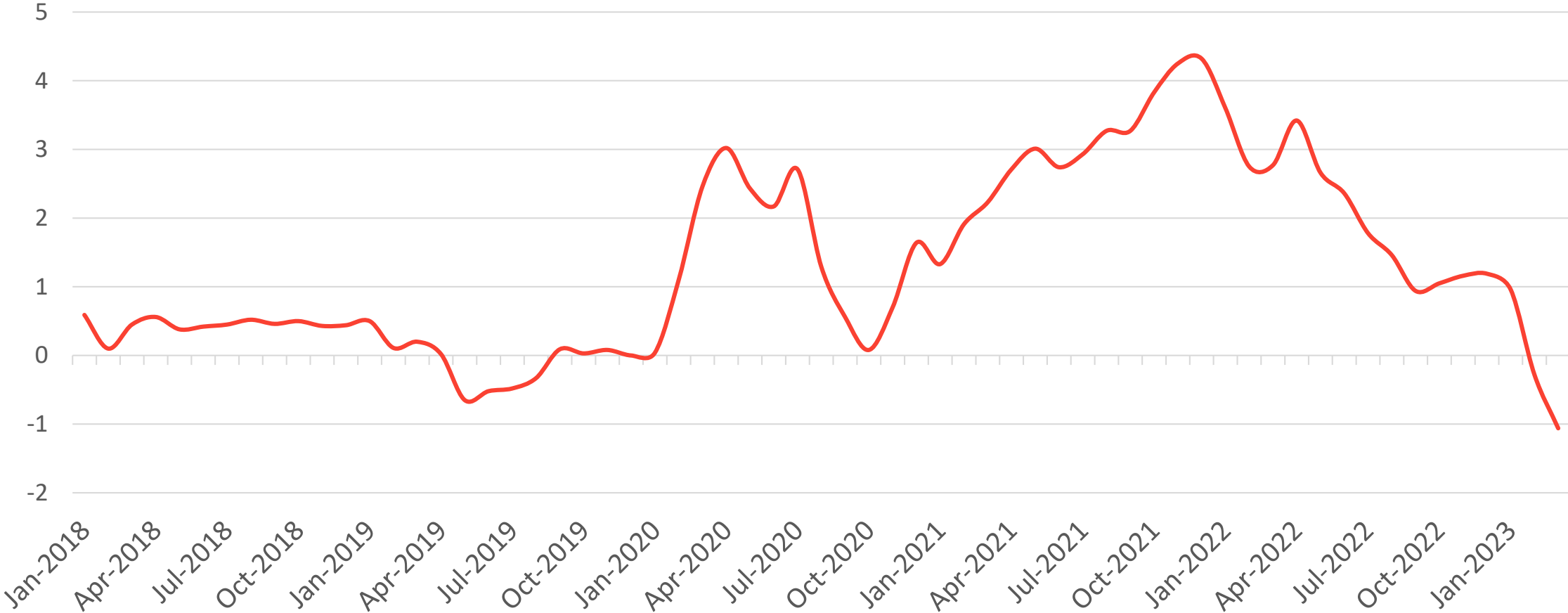
Change in construction costs, Mar. 2022–Mar. 2023



Source: Bureau of Labor Statistics

Supply Chain Pressures Globally Have Eased Back to Pre-Pandemic Levels

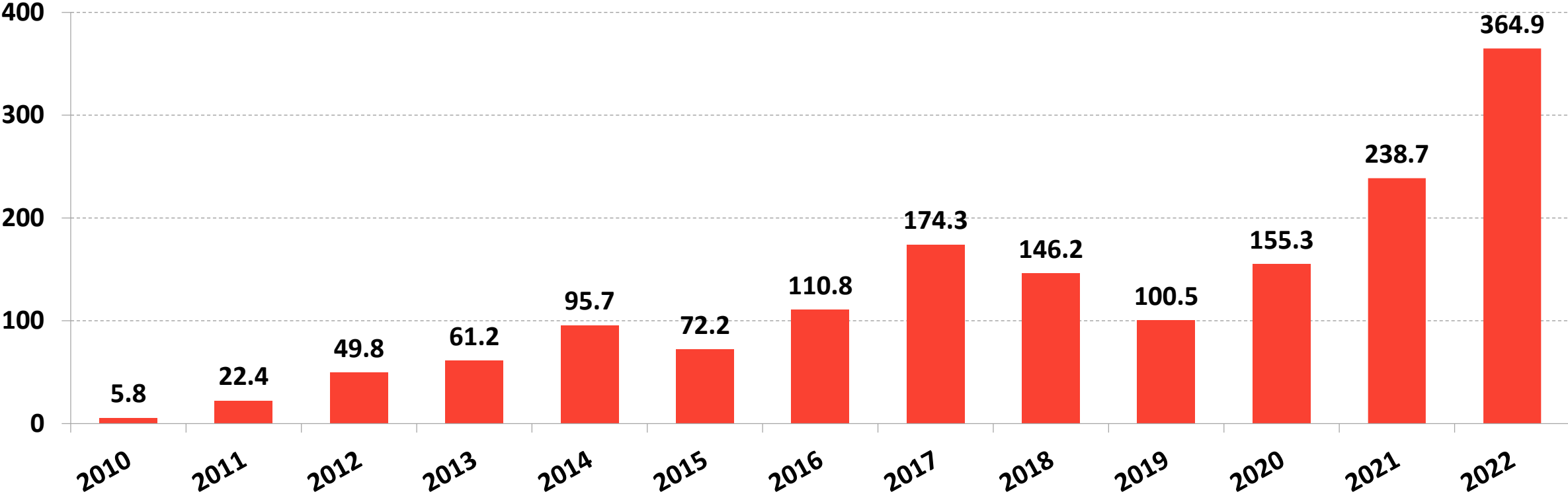
Standard deviations from average value in the Global Supply Chain Pressure Index



Source: Federal Reserve Bank of New York, Global Supply Chain Pressure Index, <https://www.newyorkfed.org/research/gscpi.html>.

Reshoring and Foreign Direct Investment Have Produced a Recent Surge in Domestic Manufacturing Positions

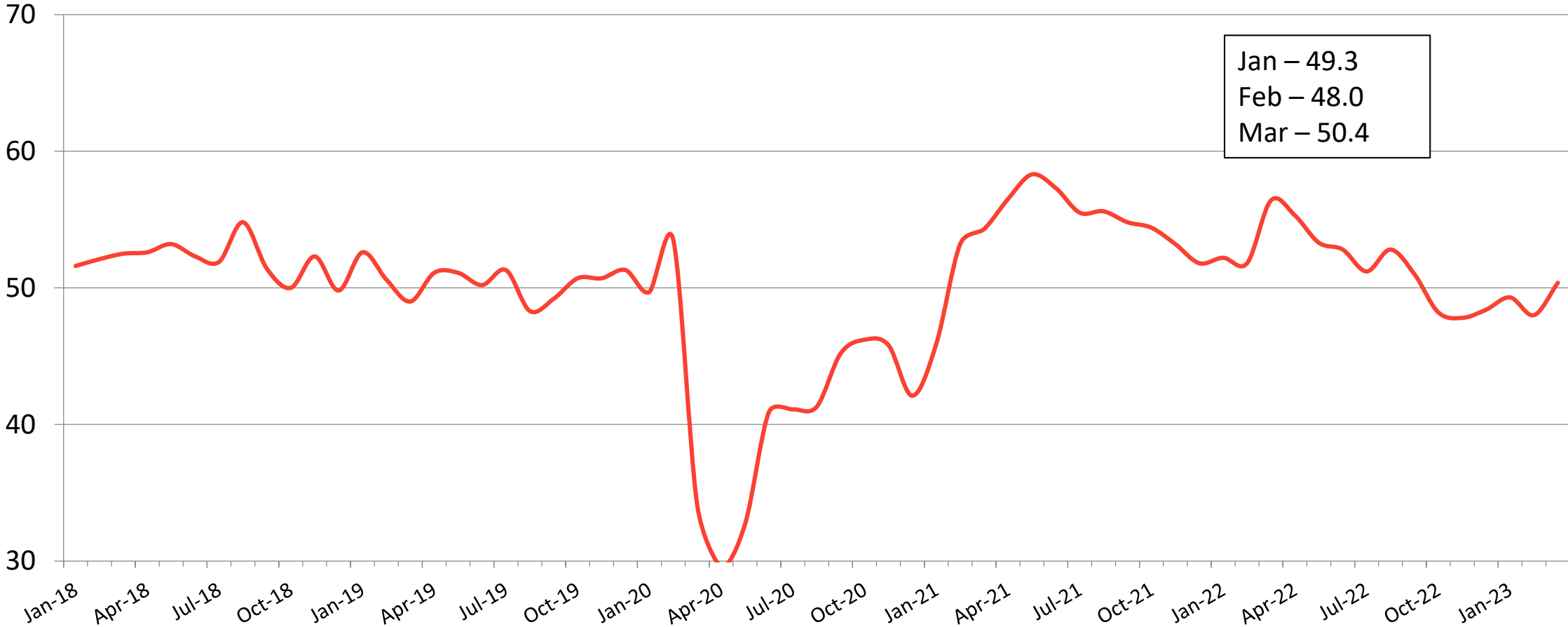
Manufacturing jobs created by reshoring and foreign direct investment (000s)



Source: Reshoring Initiative.

Architecture Firm Billings Modestly Improved in March, Following a Five-Month Downturn

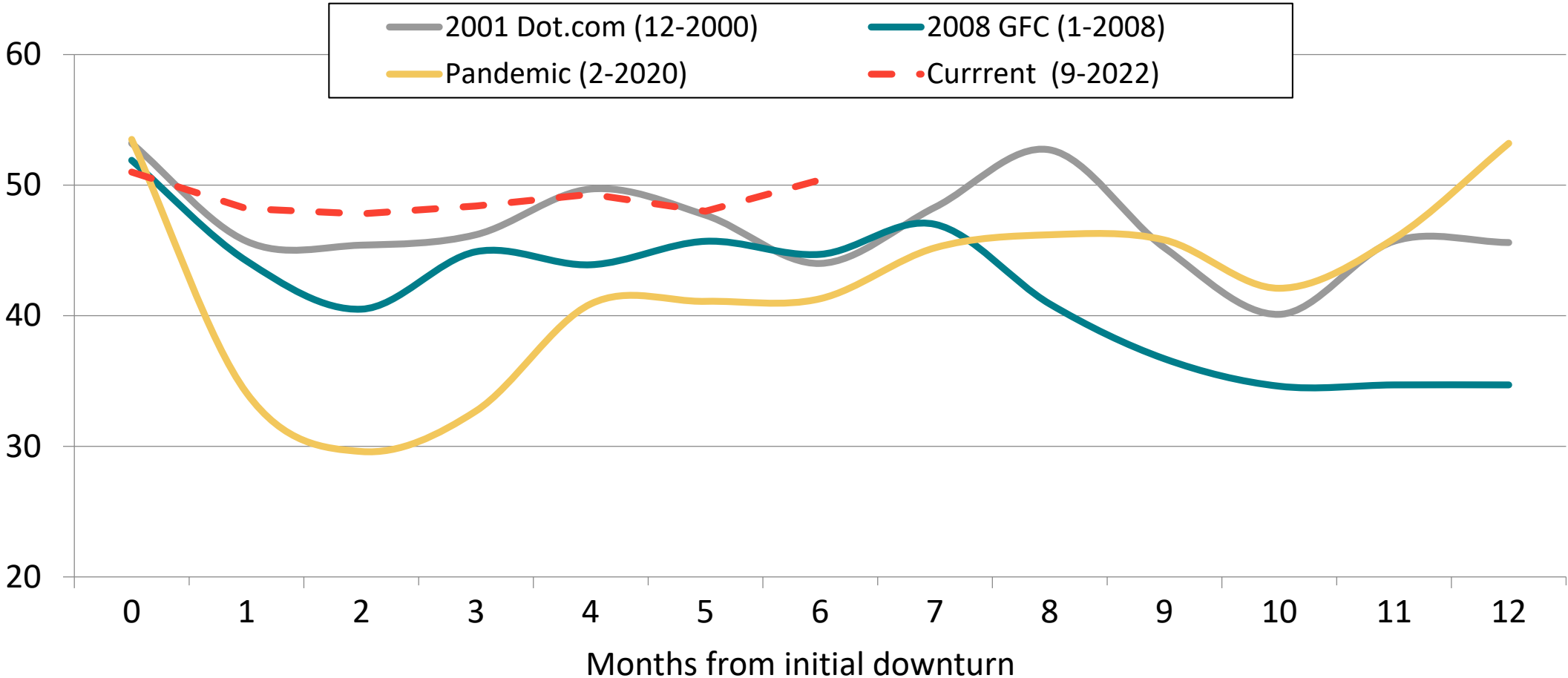
Diffusion index: 50 = no change from previous month, seasonally adjusted



Source: AIA/Deltek Architecture Billings Index

In the Previous Three Recessions, ABI Downturn at Onset Was Much Sharper

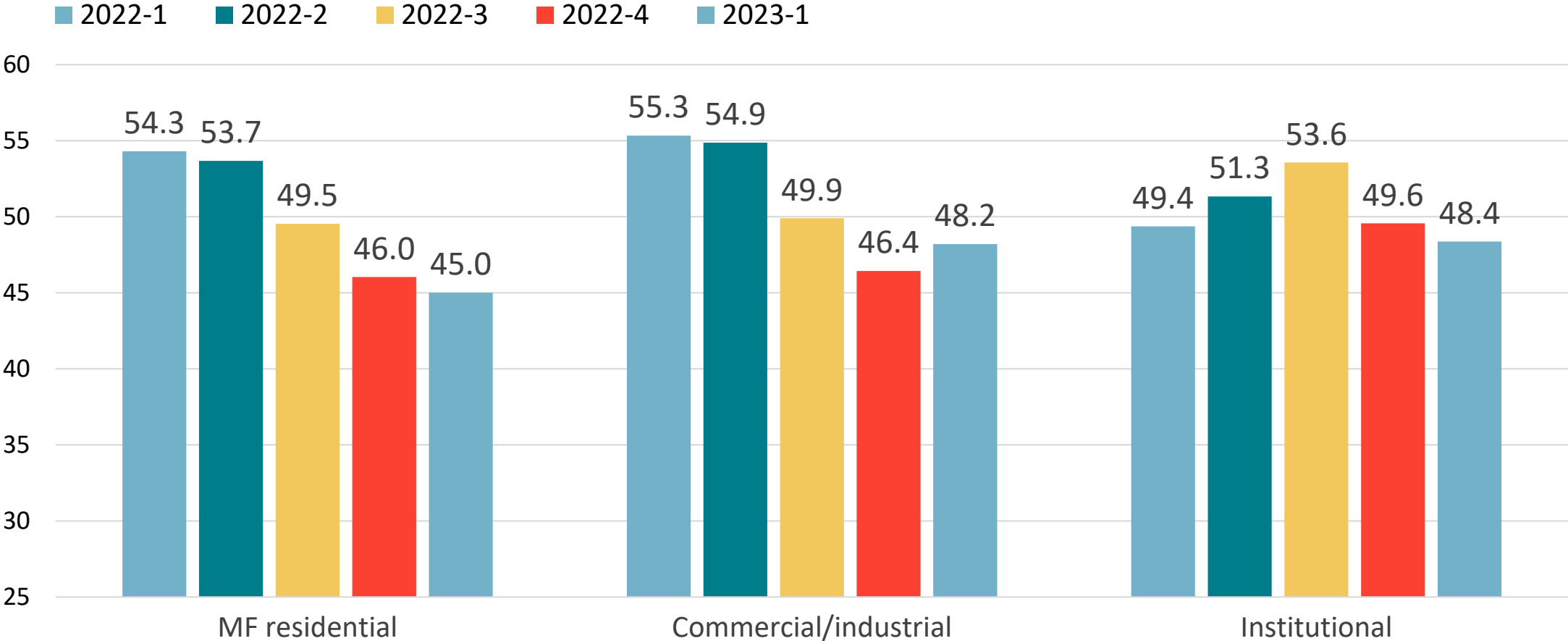
Diffusion index: 50 = no change from previous month, seasonally adjusted



Source: AIA/Deltek Architecture Billings Index

Multifamily Residential and Commercial/Industrial Responsible for Recent Weakness, but Institutional Sector Also Faltering

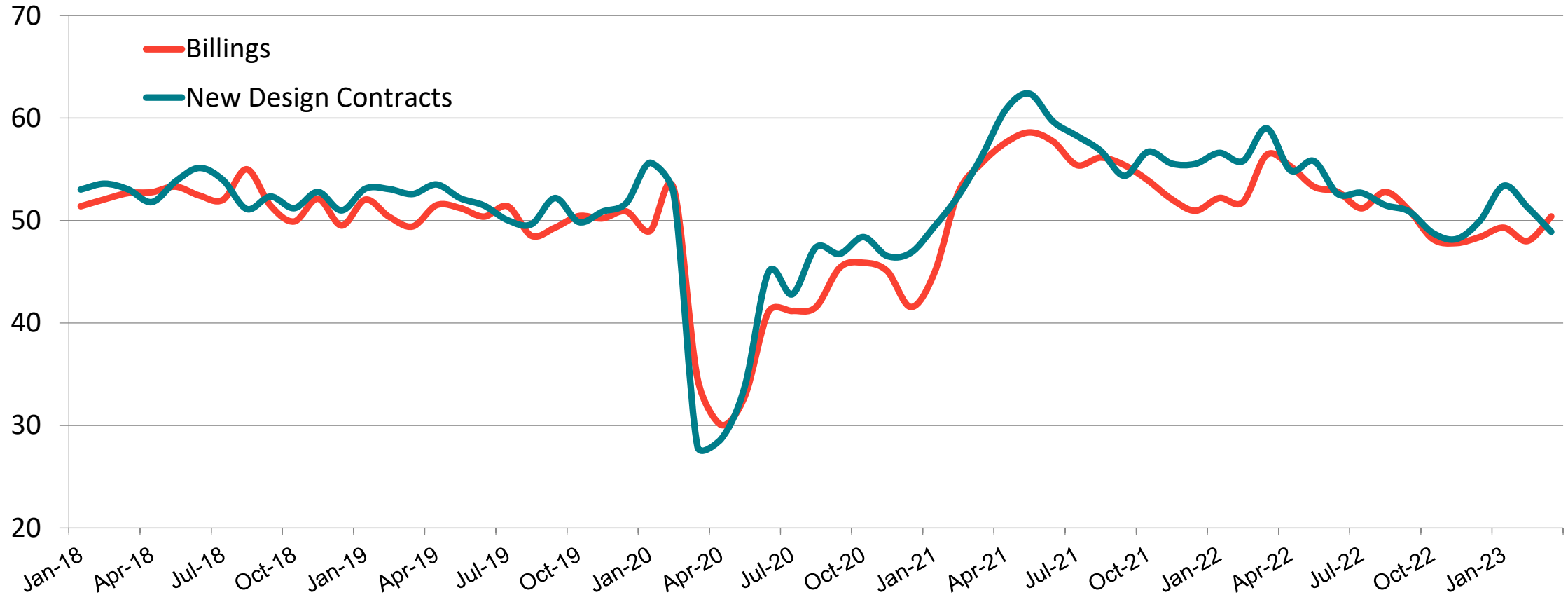
ABI scores by quarter for 2022 and 2023



Source: AIA/Deltek Architecture Billings Index

New Design Contracts Have Been Almost as Soft as Billings, Suggesting Workloads Won't Accelerate Anytime Soon

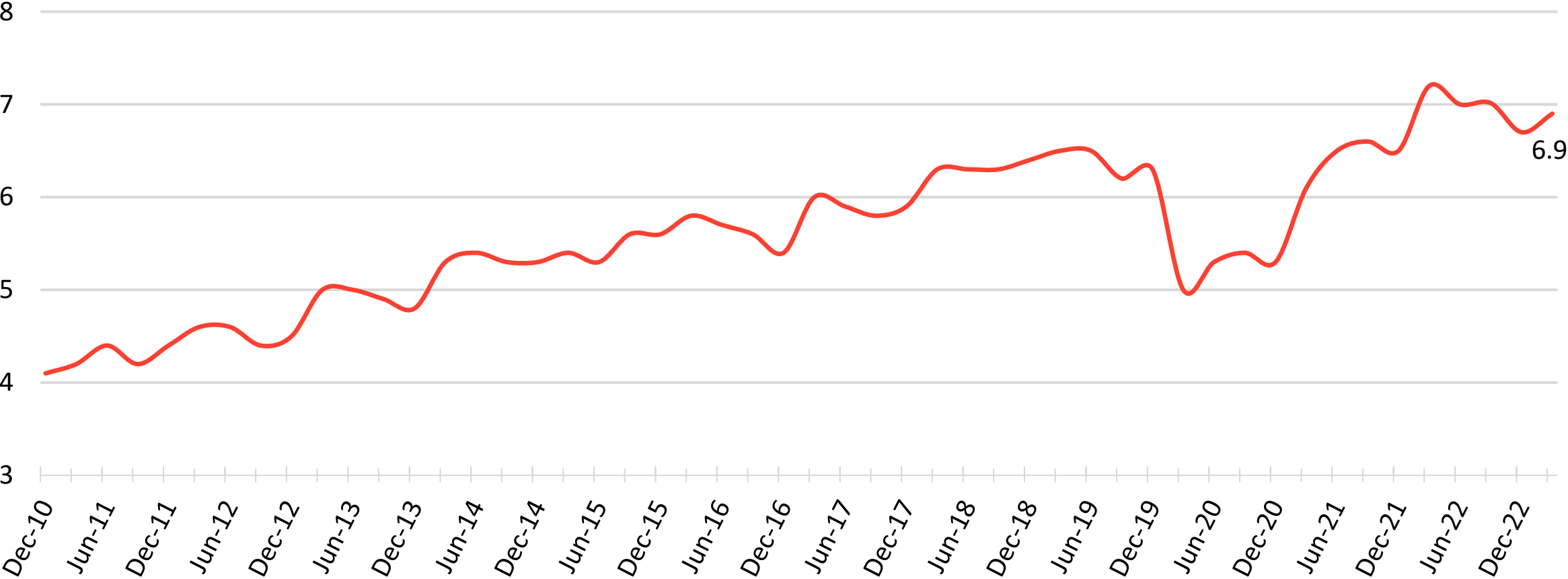
Diffusion index: 50 = no change from previous month, seasonally adjusted



Source: AIA Architecture Billings Index

Architecture Firm Backlogs—Averaging Around Seven Months—Have Stabilized Recently

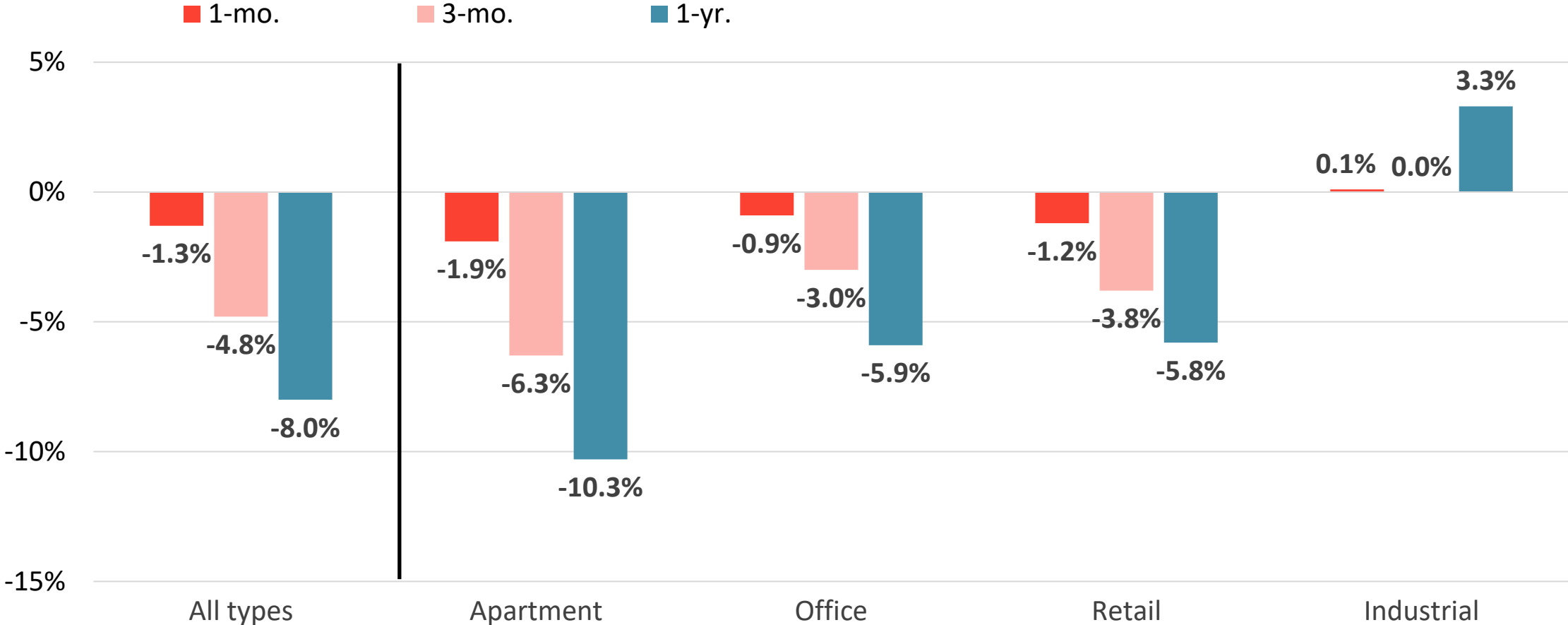
Average backlog at architecture firms (months)



Source: AIA Work-on-the-Boards survey

Multifamily Rentals Have Paced the Recent Downturn Nationally in Commercial Property Values

Change in price index for March 2023

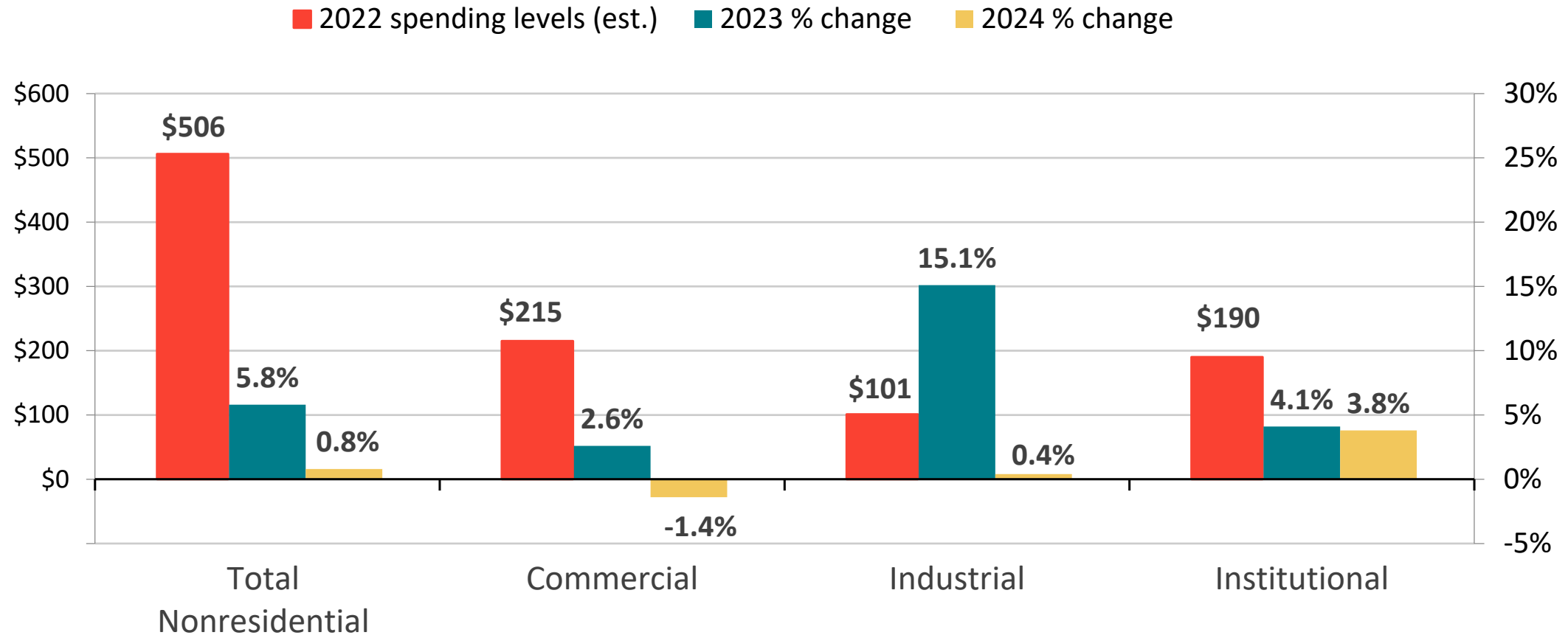


Source: RCA Commercial Property Price Indexes

Construction Spending Expected To Remain Relatively Healthy This Year Before Slowing Significantly in 2024



Billions \$ / % change - construction spending on nonresidential buildings

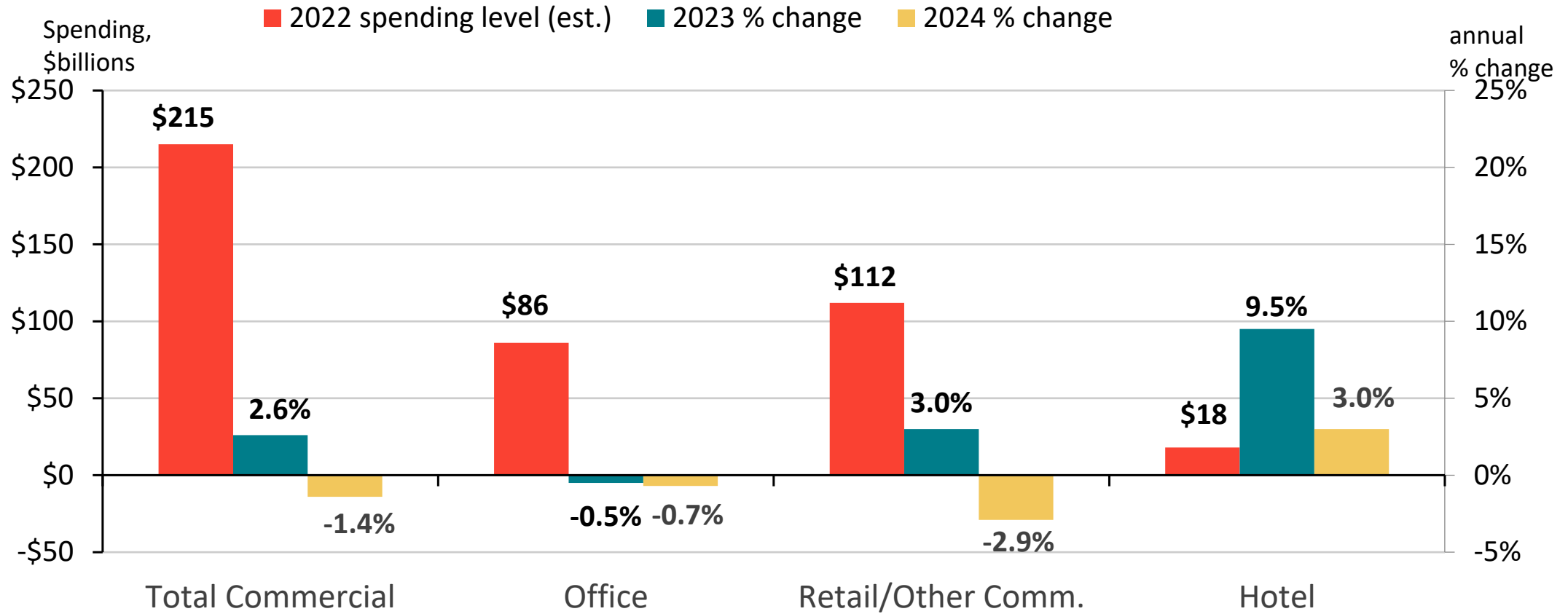


Source: AIA Consensus Construction Forecast Panel, December 2022

Retail Construction Has Seen Healthy Growth, but This Sector, Along With Offices Expected To Slip Next Year



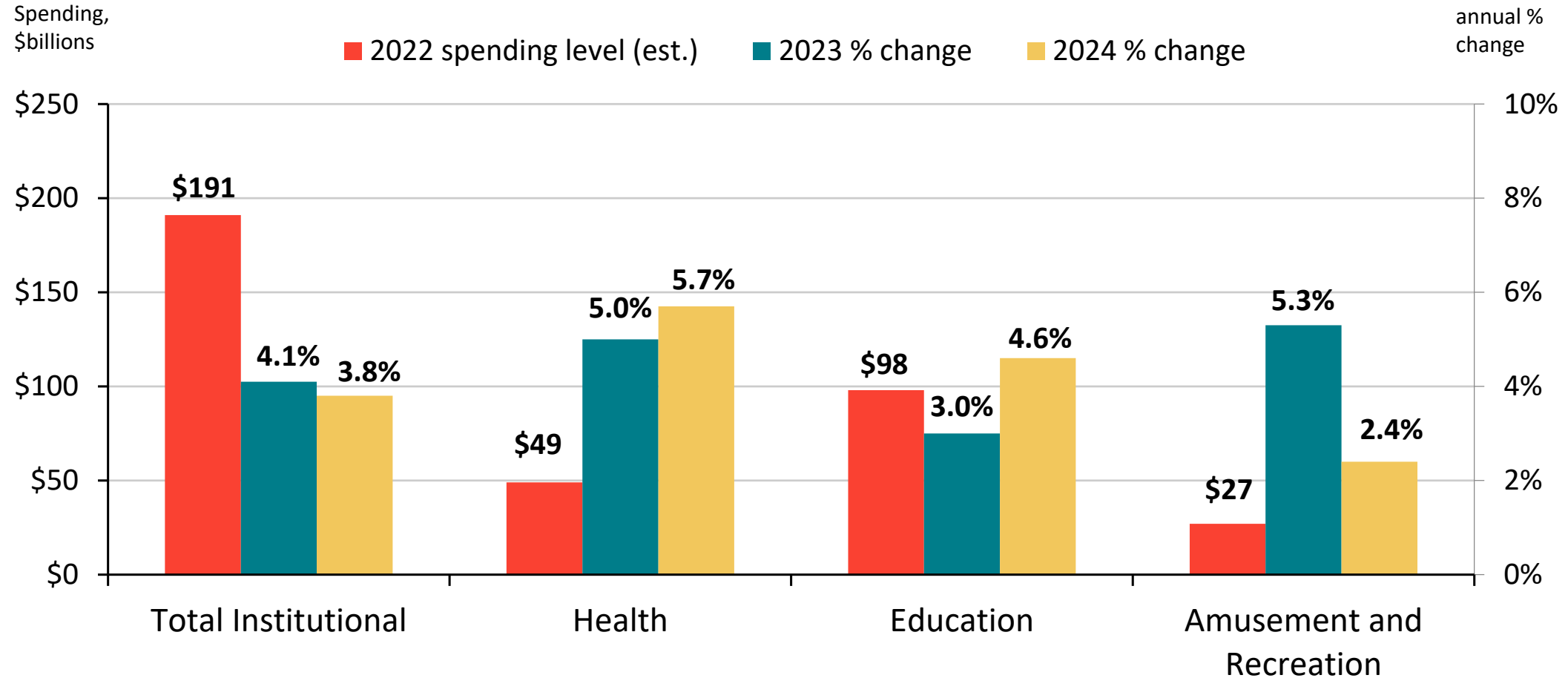
Billions \$ / % change - construction spending on nonresidential buildings



Source: AIA Consensus Construction Forecast Panel, December 2022

Institutional Sector Recovery Underway; Spending Projected To Remain Relatively Healthy This Year and Next

Billions \$ / % change—construction spending on nonresidential buildings



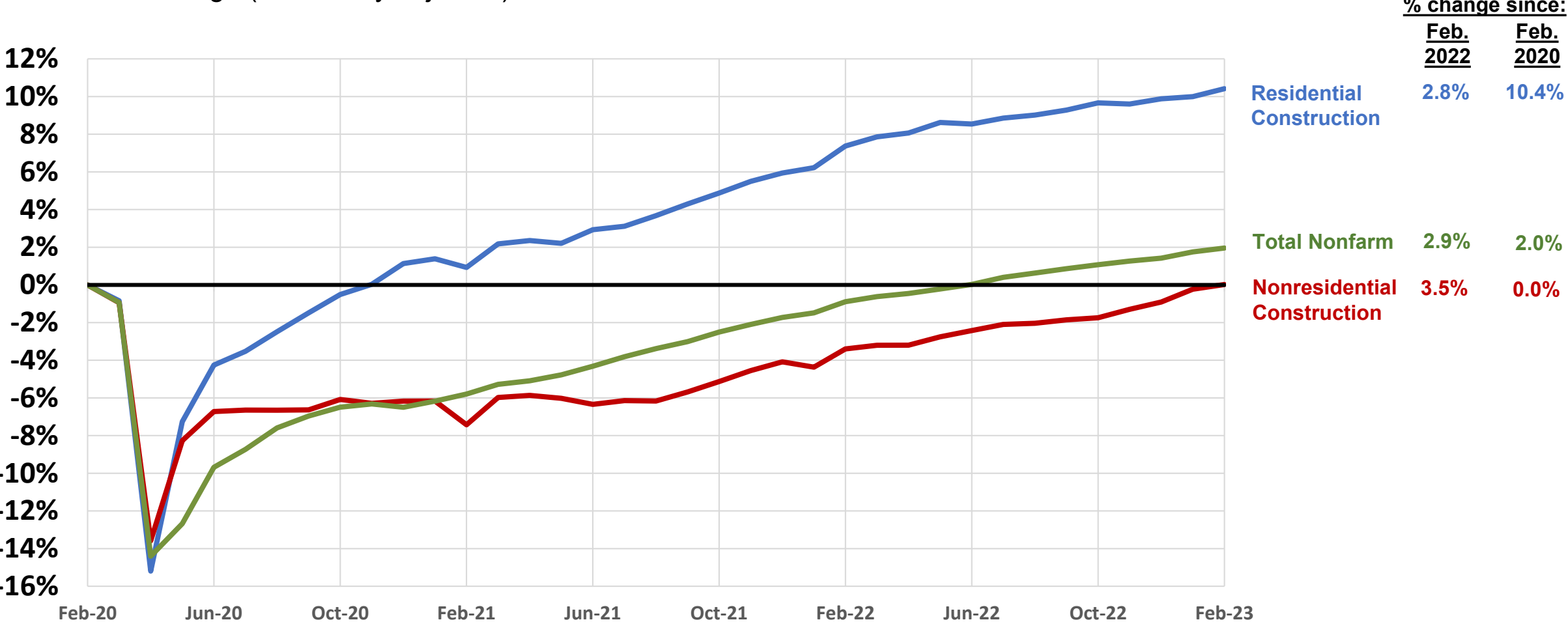
Source: AIA Consensus Construction Forecast Panel, December 2022

Ken Simonson

Chief Economist,
Associated General
Contractors of America



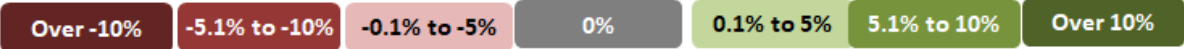
Cumulative change (seasonally adjusted)



Source: BLS current employment statistics, <https://www.bls.gov/ces/>

Construction employment change by state, Mar. 2022–Mar. 2023 (U.S.: 2.5%)

44 states **up**, 5 states **down**, 1 state + DC unchanged

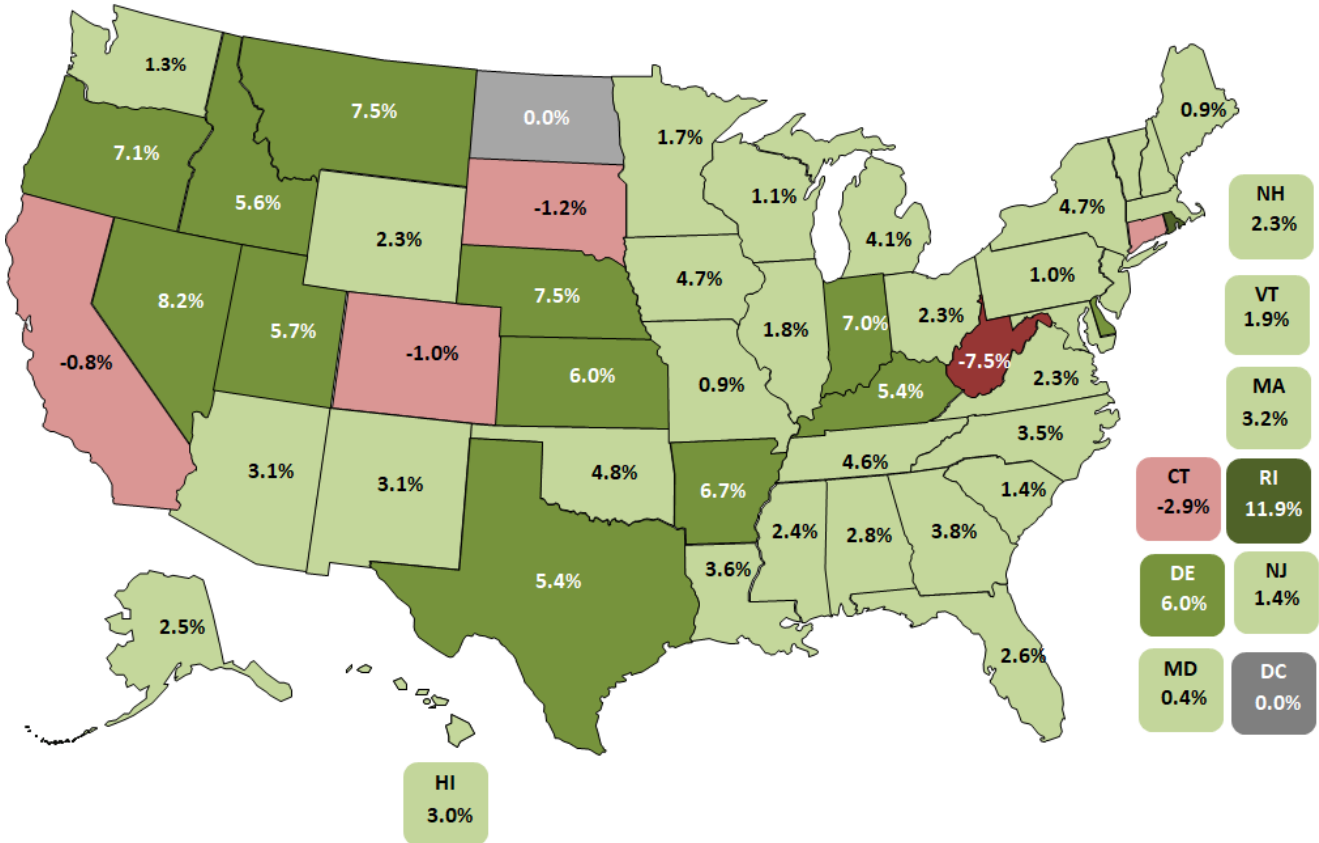


Top 5

RI	11.9%
NV	8.2%
MT	7.5%
NE	7.5%
OR	7.1%

Bottom 5

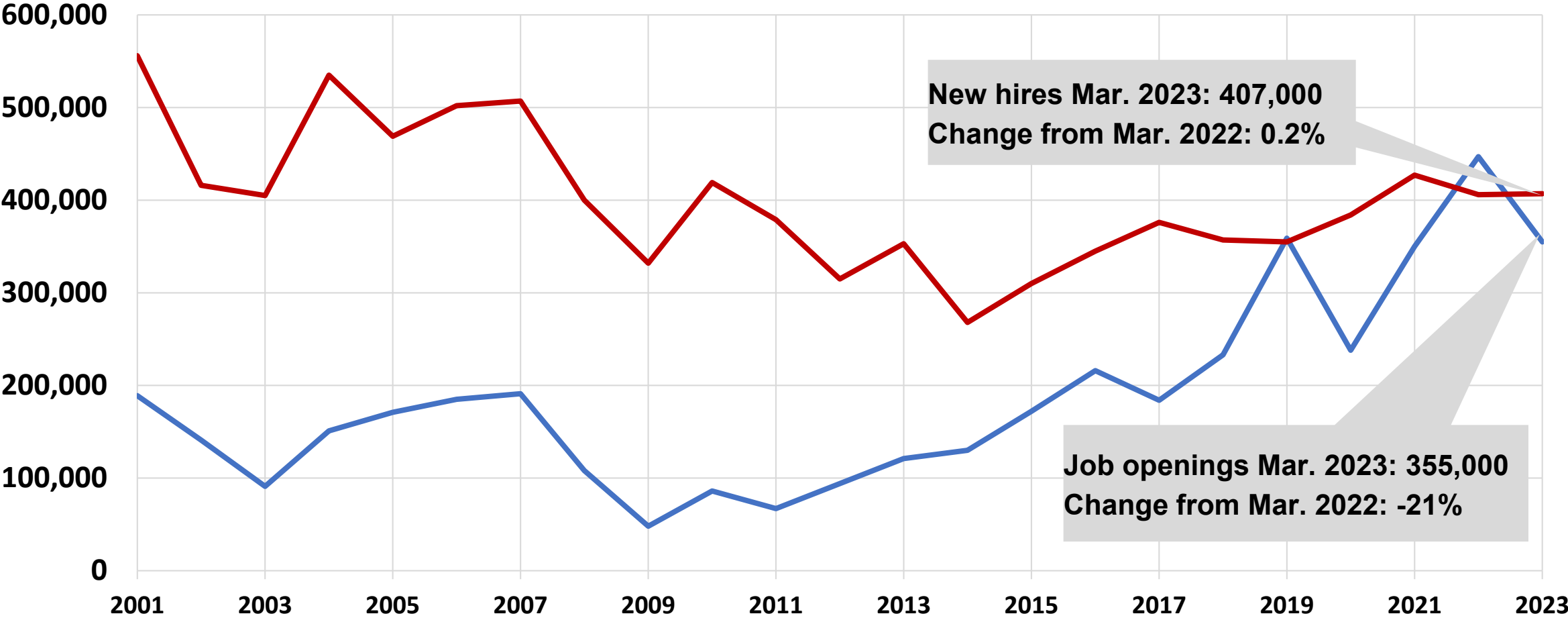
WV	-7.5%
CT	-2.9%
SD	-1.2%
CO	-1.0%
CA	-0.8%



Source: Bureau of Labor Statistics, state and area employment, www.bls.gov/sae

Construction Job Openings & New Hires

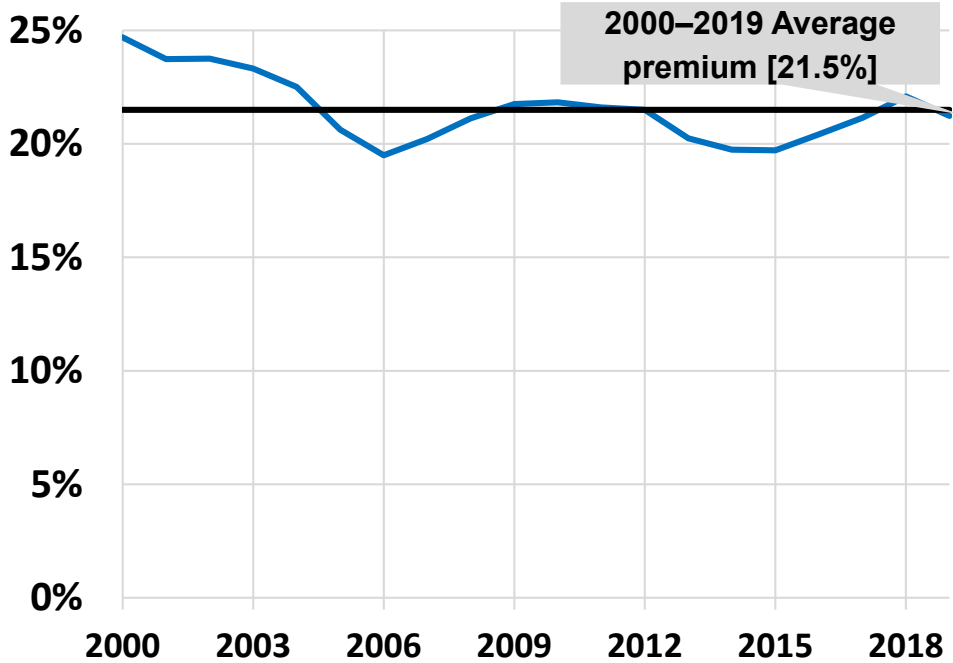
Job openings and hires, Mar. 2001–Mar. 2023, not seasonally adjusted



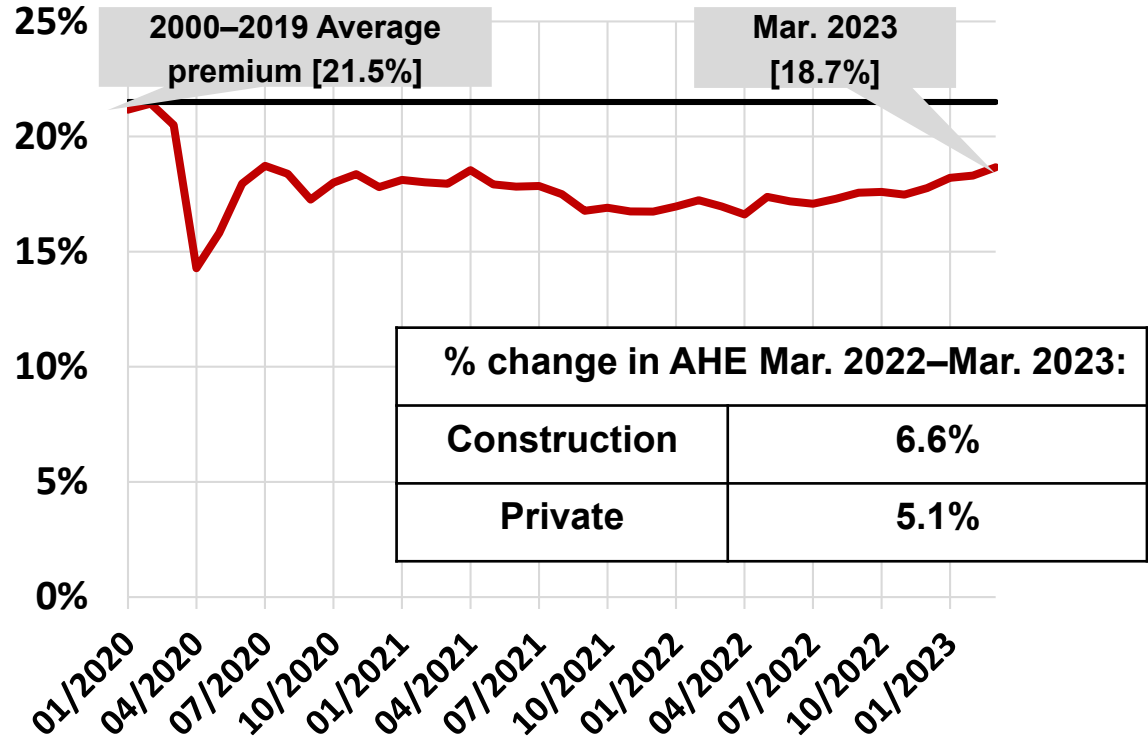
Source: Bureau of Labor Statistics, www.bls.gov/jlt, Job Openings & Labor Turnover Survey (JOLTS)

Excess of average hourly earnings (AHE) for production and nonsupervisory employees in construction vs. private sector

Annual premium, 2000–2019



Monthly premium, Jan. 2020–Mar. 2023
(seasonally adjusted)



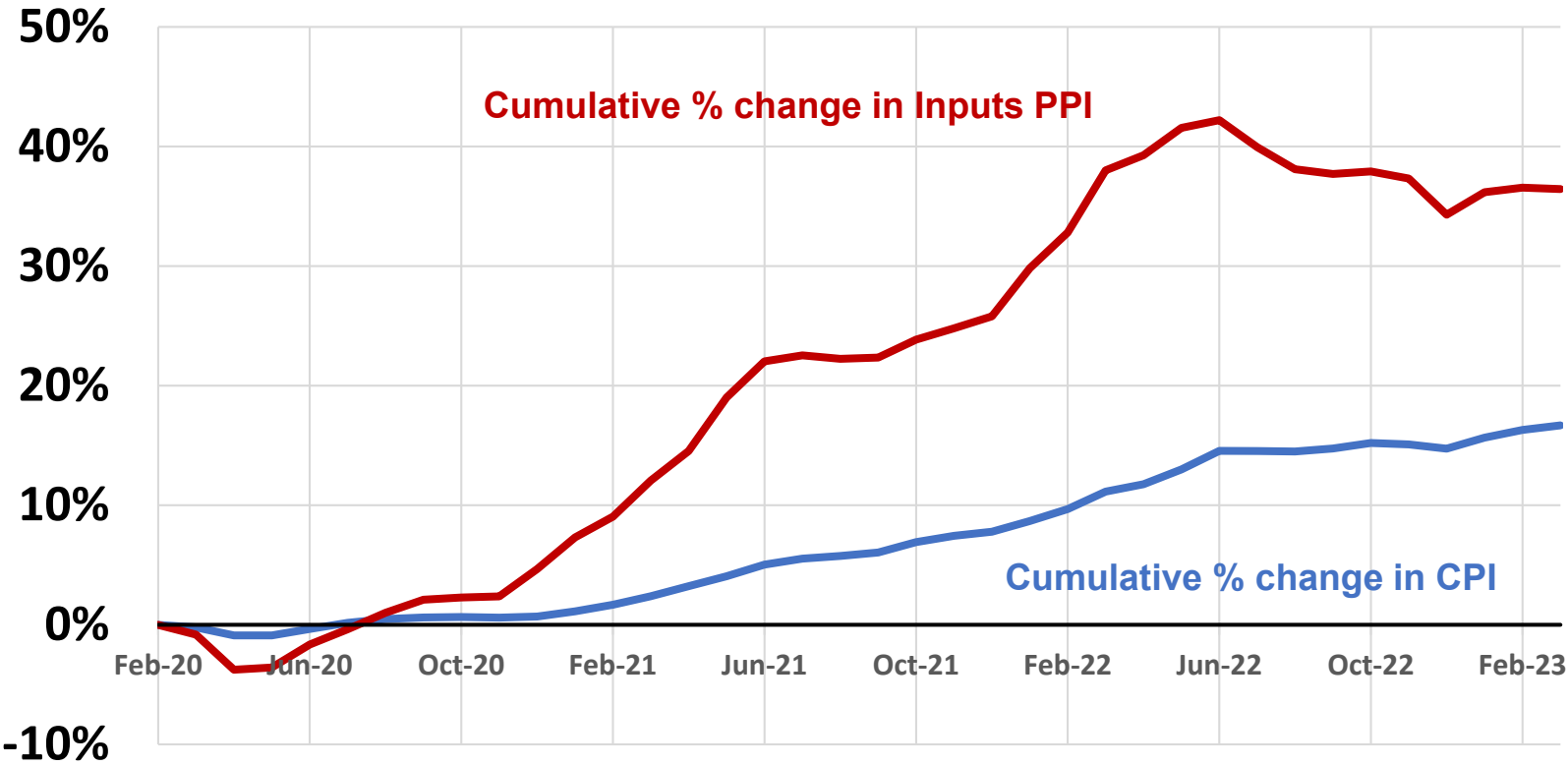
Sources: BLS, www.bls.gov/ces

Costs for New Nonresidential Construction vs. Consumer Prices



Cumulative change in PPI for new nonresidential construction inputs and CPI

Feb. 2020–Mar. 2023, not seasonally adjusted



% change to Mar. 2023 since:	Inputs PPI	CPI
Feb. 2020	36%	17%
Mar. 2022	-1.1%	5.0%
Feb. 2023	-0.1%	0.3%

Source: Bureau of Labor Statistics, Consumer Price Index, www.bls.gov/cpi; Producer Price Index, www.bls.gov/ppi

Not All Construction Costs Are Cooling!

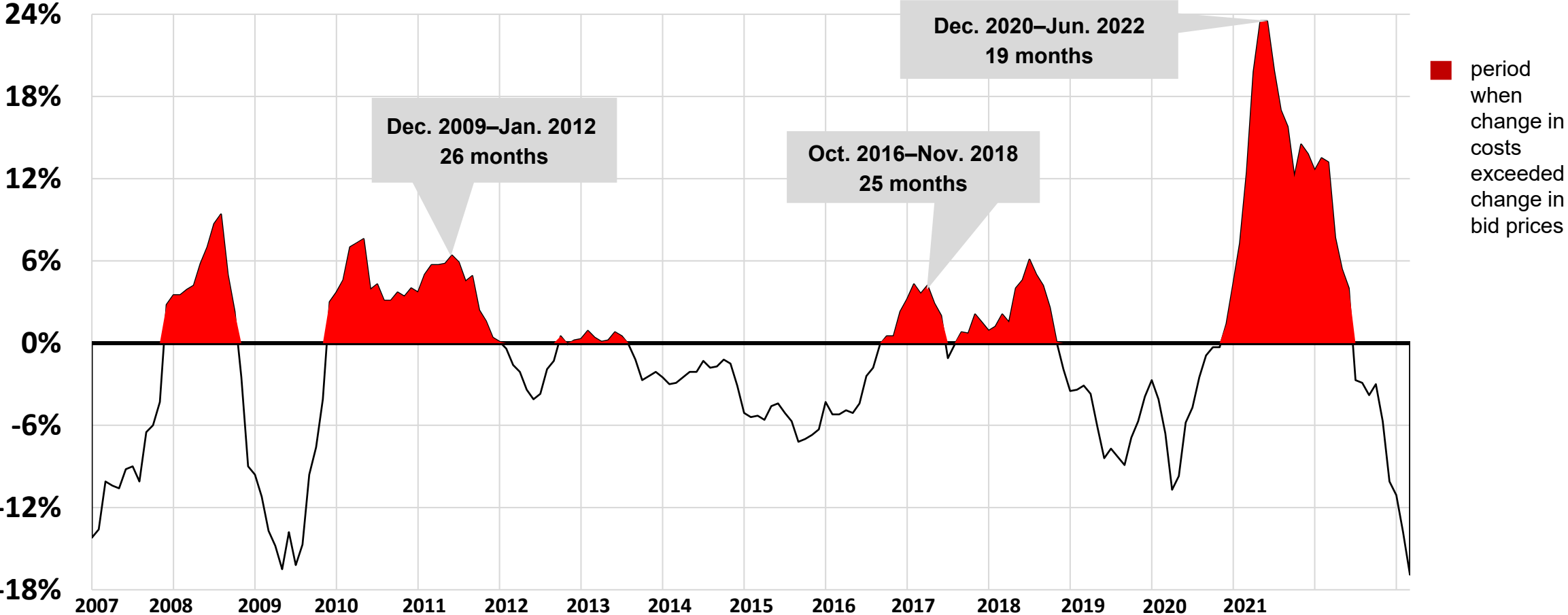
Producer Price Indexes, 1- & 12-mo. change (not seasonally adjusted)

	<u>Mar. 2023 change from:</u>	
	<u>Feb. 2023</u>	<u>Mar. 2022</u>
	<u>(1 month)</u>	<u>(12 months)</u>
Cement	0.3%	17.0%
Asphalt paving mixtures and blocks	-0.1%	14.1%
Construction machinery and equipment	0.2%	11.8%
Gypsum building products	-0.1%	11.8%
<u>Subcontractor price indexes, nonresidential building</u>		
Roofing contractors	0.2%	19.5%
Plumbing contractors	0.8%	12.5%
Electrical contractors	0.1%	18.8%
Concrete contractors	0.1%	8.0%

Source: BLS, producer price indexes, www.bls.gov/ppi

Cost Squeeze on Contractors Can Reappear Suddenly, Last 2+ Years

Difference between year-over-year change in materials costs vs. bid prices, Jan. 2007–Mar. 2023



Source: BLS, www.bls.gov/ppi, producer price indexes for goods inputs to nonresidential construction (material costs) and new school building construction (bid prices)

Current (not inflation-adjusted) dollars, seasonally adjusted

Total 4%: Private residential -10% (Single-Family -23%; Multi 23%; Improvements -2%); Public Residential 10%
Nonresidential 19% (Private 21%, Public 15%)

Nonresidential segments (in descending order of Mar. 2023 spending)

- Manufacturing 62% (Computer/Electronic 179%; Chemical 22%; Food/Beverage/Tobacco 49%; Transportation Equipment 22%)
- Commercial 20% (Warehouse 22%; Retail 22%; Farm 1%)
- Highway and Street 21%
- Power -3% (Electric -5%; Oil/Gas Fields & Pipelines -2%)
- Education 11%
- Office 15%
- Transportation 12%
- Healthcare 11%

- Other: Sewage/Waste Disposal 26%; Amusement/Recreation 13%; Communications 5%; Water Supply 26%; Lodging 38%

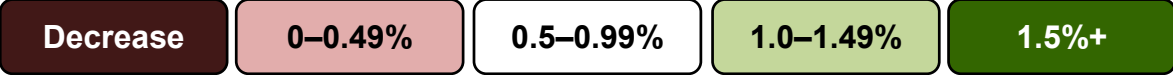
- Economic recovery should continue, but the likelihood of recession remains high
- Homebuilding is likely to fall for several months until prices, interest rates flatten
- Multifamily, warehouse, retail, office, lodging are at risk from slowdown, rising rates
- Infrastructure Investment & Jobs Act, CHIPS and Science Act, Inflation Reduction Act will give a major boost to infrastructure, manufacturing, and power construction

BUT

- money will be slow to turn into construction awards and spending
- Buy America(n), labor, and environmental strings may tie up project starts for years
- Materials cost and lead time trends are mixed, no longer all upward
- Labor availability has resumed being the #1 challenge for many contractors

- Finding workers will be a challenge for much longer than materials costs or supply
- Slower population growth means slower demand growth for most construction
- Slowing demand for K-12, decline for higher ed construction
- Permanent shift from retail to e-commerce/distribution structures
- More specialized and online healthcare facilities; fewer hospitals, nursing homes
- More wind, solar, battery storage and charging facilities, and related manufacturing
- Not clear if offices will decentralize or remain in less demand
- Not clear if recent urban/rural or state-to-state migration will remain or reverse

Population Change by State, Jul. 2021–Jul. 2022 (U.S.: 0.38%)

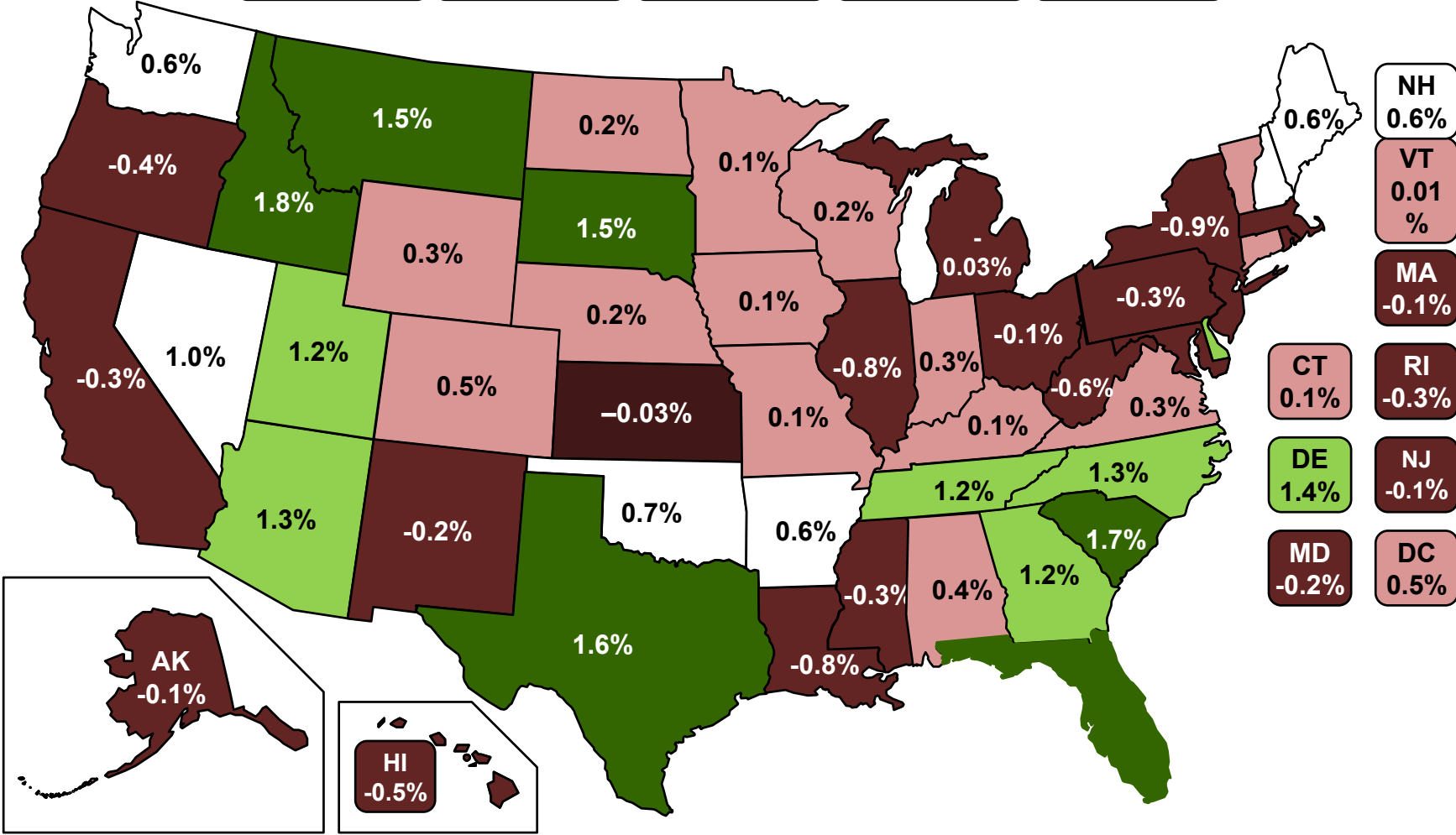


Top 6

FL	1.9%
ID	1.8%
SC	1.7%
TX	1.6%
SD, MT	1.5%

Bottom 5

NY	-0.9%
IL	-0.8%
LA	-0.8%
WV	-0.6%
HI	-0.5%



Source: U.S. Census Bureau, Dec. 2022 population estimates, www.census.gov/popest

Email me at ken.simonson@agc.org

- **2023 AGC/Sage Construction Hiring & Business Outlook Survey Results:** <https://www.agc.org/2023-construction-hiring-and-business-outlook>
- **The Data DIGest:** weekly 1-page email (subscribe at <http://store.agc.org>)
- **Construction Inflation Alert:** <https://www.agc.org/learn/construction-data/agc-construction-inflation-alert>
- **ConsensusDocs Price Escalation Resource Center:** <https://www.consensusdocs.org/price-escalation-clause/>
- **Surveys, State and Metro Data, Fact Sheets:** www.agc.org/learn/construction-data
- **Monthly Press Releases:** construction spending; Producer Price Indexes; national, state, metro employment with rankings: <https://www.agc.org/newsroom>



Kristy O'Brien

Director of Private Content Acquisition,
ConstructConnect

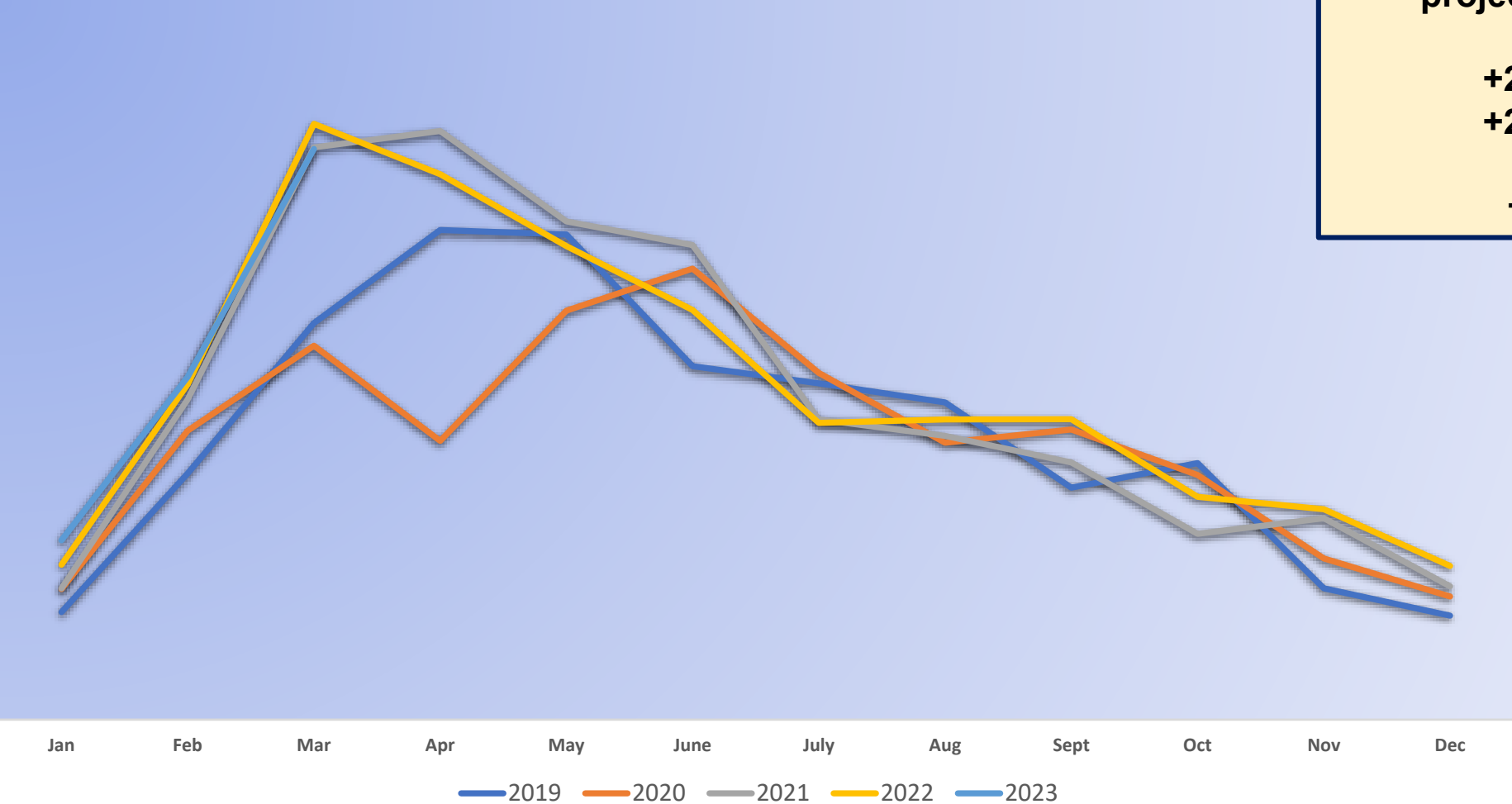


United States
ConstructConnect Bid Projects by Month 2019-2023



When comparing prior years' Q1 bids, 2023 U.S. bid projects are trending:
+11% vs. 2019
+7% vs. 2020
+20% vs. 2021
-2% vs. 2022

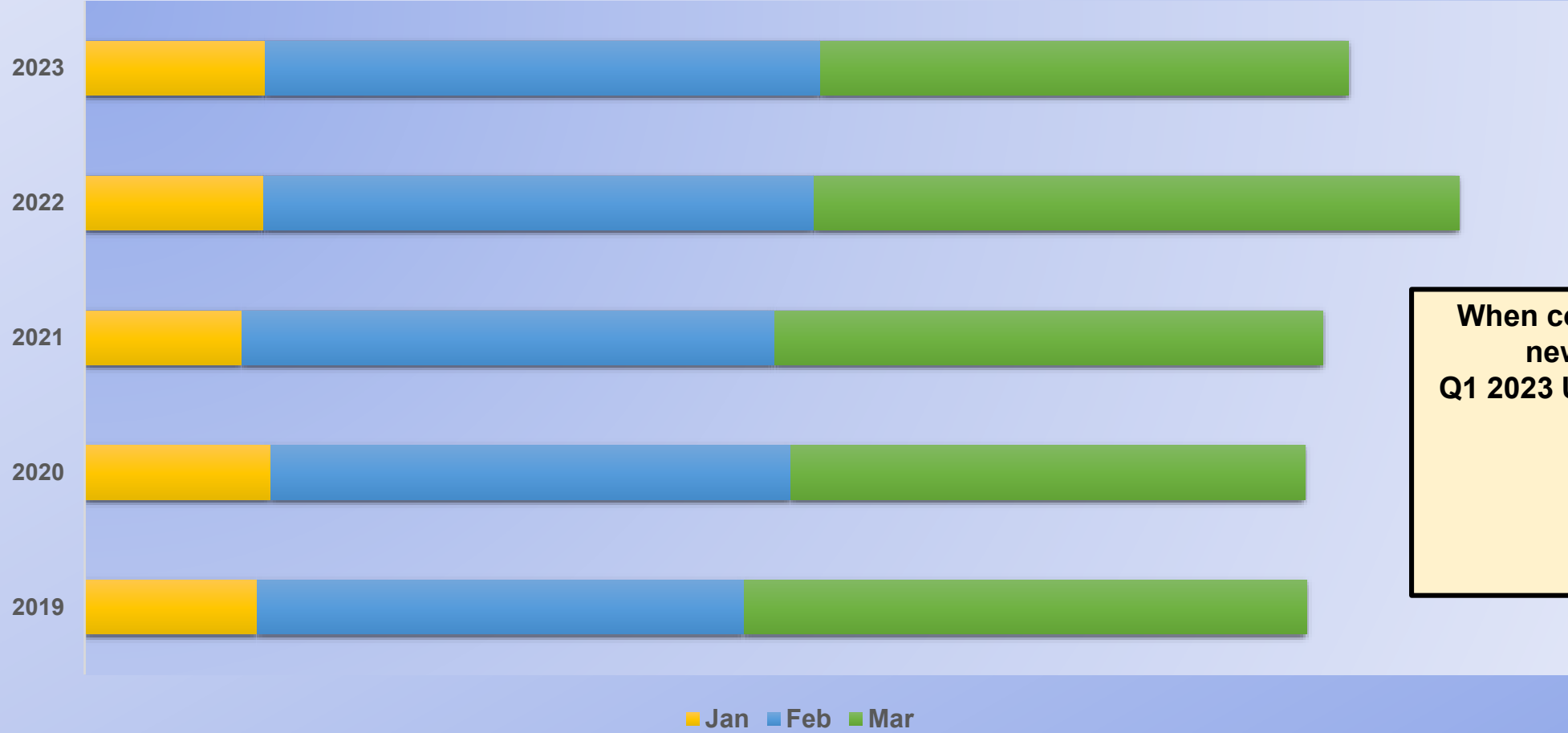
Canada
ConstructConnect Bid Projects by Month 2019-2023



When comparing prior years' Q1 bids, 2023 Canada bid projects are trending:

- +29% vs. 2019**
- +24% vs. 2020**
- 5% vs. 2021**
- +0% vs. 2022**

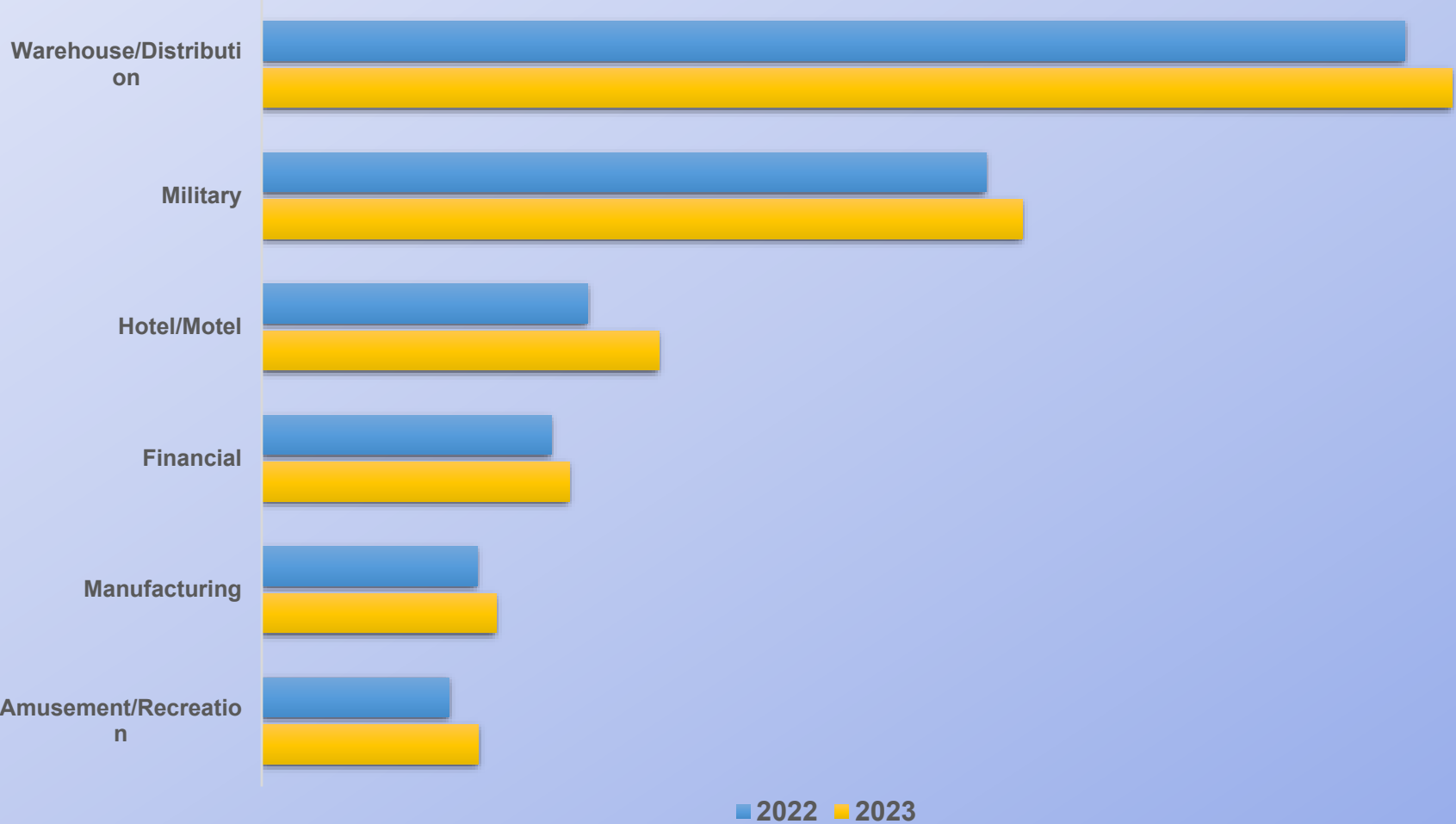
United States ConstructConnect New Projects by Month Q1 2019–2023



When comparing prior years' Q1 new planning projects, Q1 2023 U.S. projects are trending:

- +3% vs. 2019
- +3% vs. 2020
- +2% vs. 2021
- 7% vs. 2022

United States 2023 YTD ConstructConnect Building Use Increases

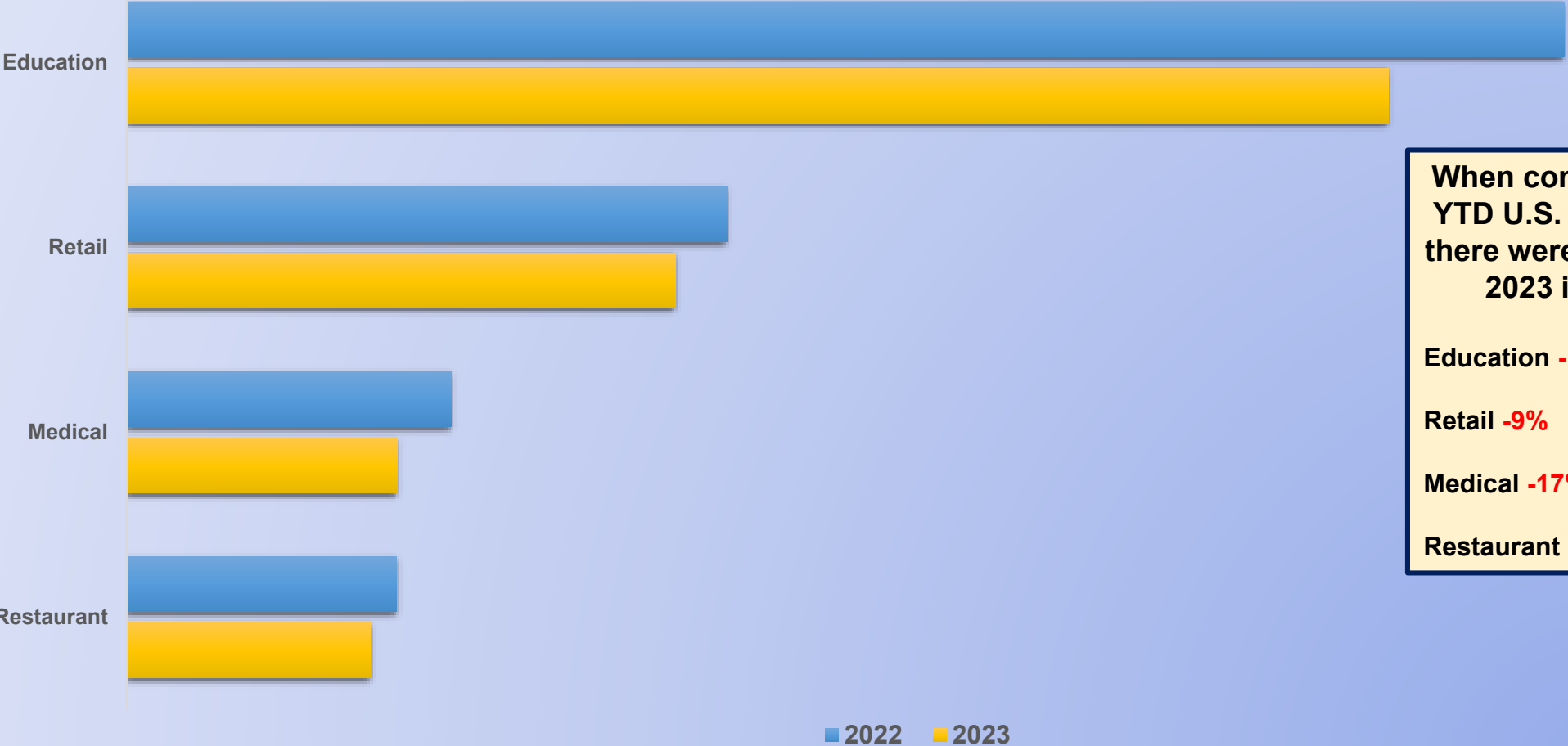


When comparing 2022 and 2023 YTD U.S. Building Use projects, there were prominent increases in 2023 in these industries:

- Warehouse/Distribution +7%**
- Military +6%**
- Hotel/Motel +22%**
- Financial +8%**
- Manufacturing +9%**
- Amusement/Recreation +16%**



United States 2023 YTD ConstructConnect Building Use Declines

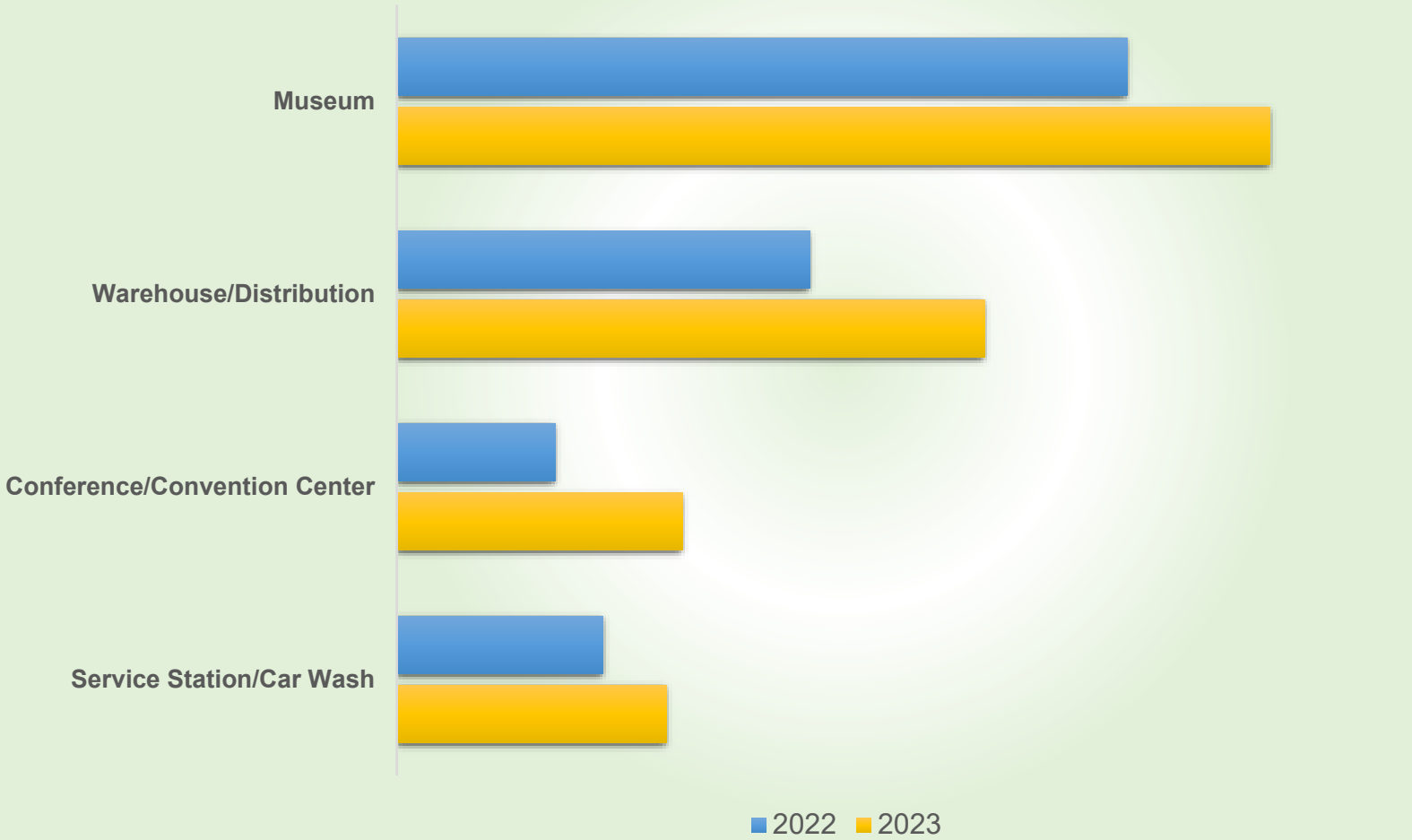


When comparing 2022 and 2023 YTD U.S. Building Use projects, there were prominent declines in 2023 in these industries:

- Education -12%
- Retail -9%
- Medical -17%
- Restaurant -10%



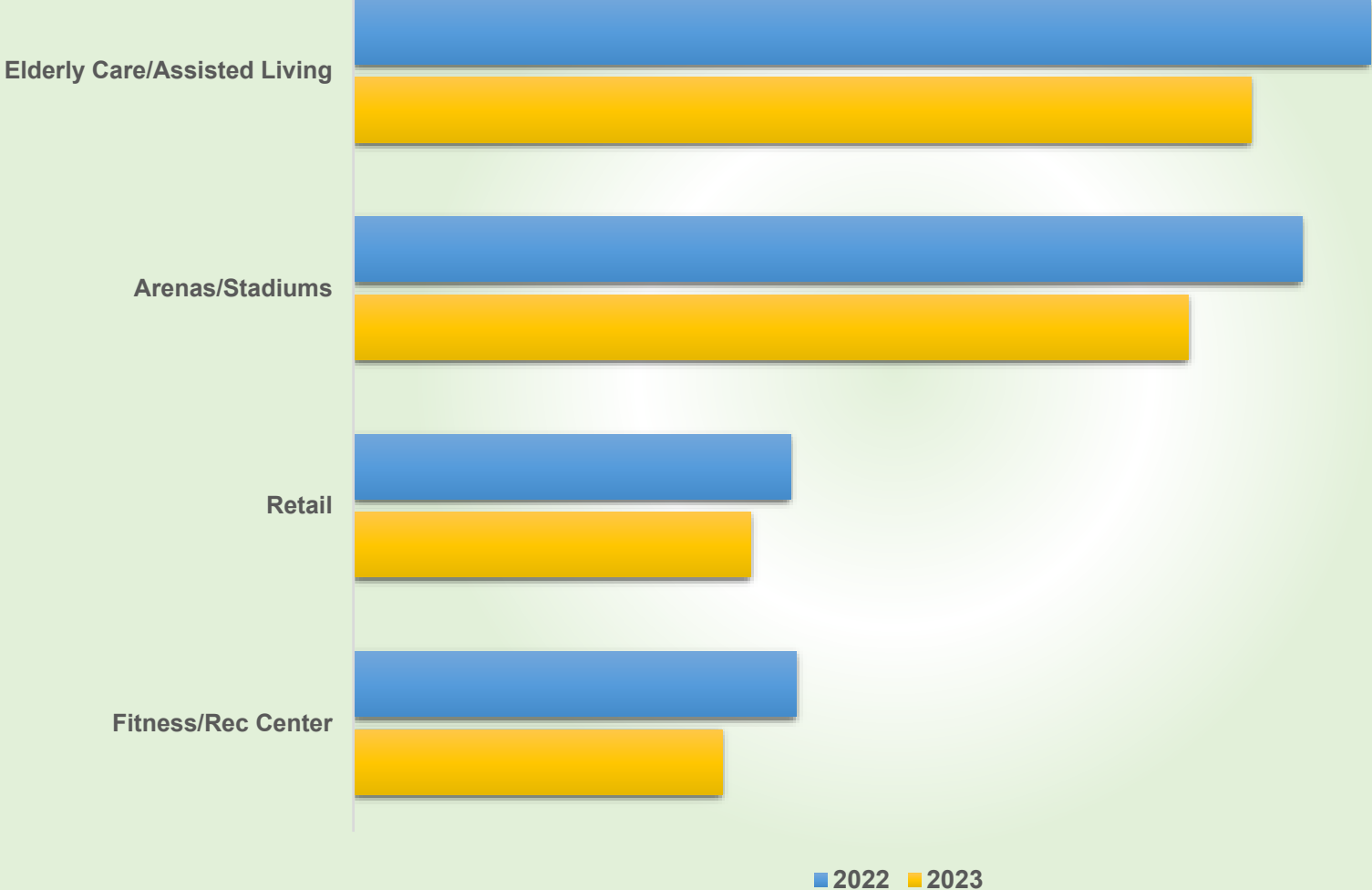
Canada 2023 YTD ConstructConnect Building Use Increases



When comparing 2022 and 2023 YTD Canada Building Use projects, there were prominent increases in 2023 in these industries:

- Museum +20%**
- Warehouse/Distribution +42%**
- Conference/Convention Center +80%**
- Service Station/Car Wash +31%**

Canada 2023 YTD ConstructConnect Building Use Declines



When comparing 2022 and 2023 YTD Canada Building Use projects, there were prominent declines in 2023 in these industries:

- Elderly Care/Assisted Living **-10%**
- Arenas/Stadiums **-12%**
- Retail **-9%**
- Fitness/Rec Center **-17%**

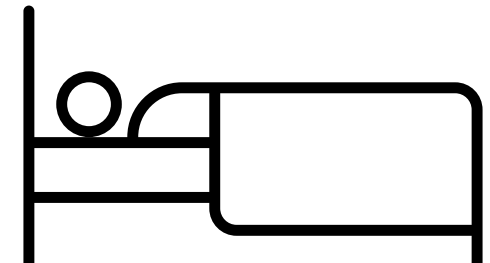
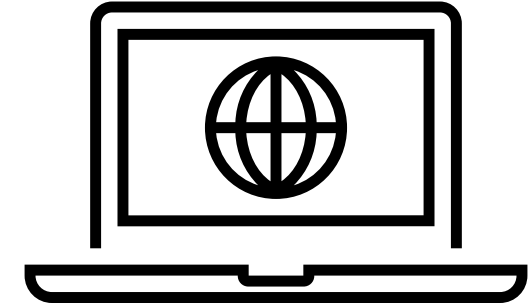


Document Size

- First quarter document upload size decreased in Q1 2023 compared to Q1 2022.

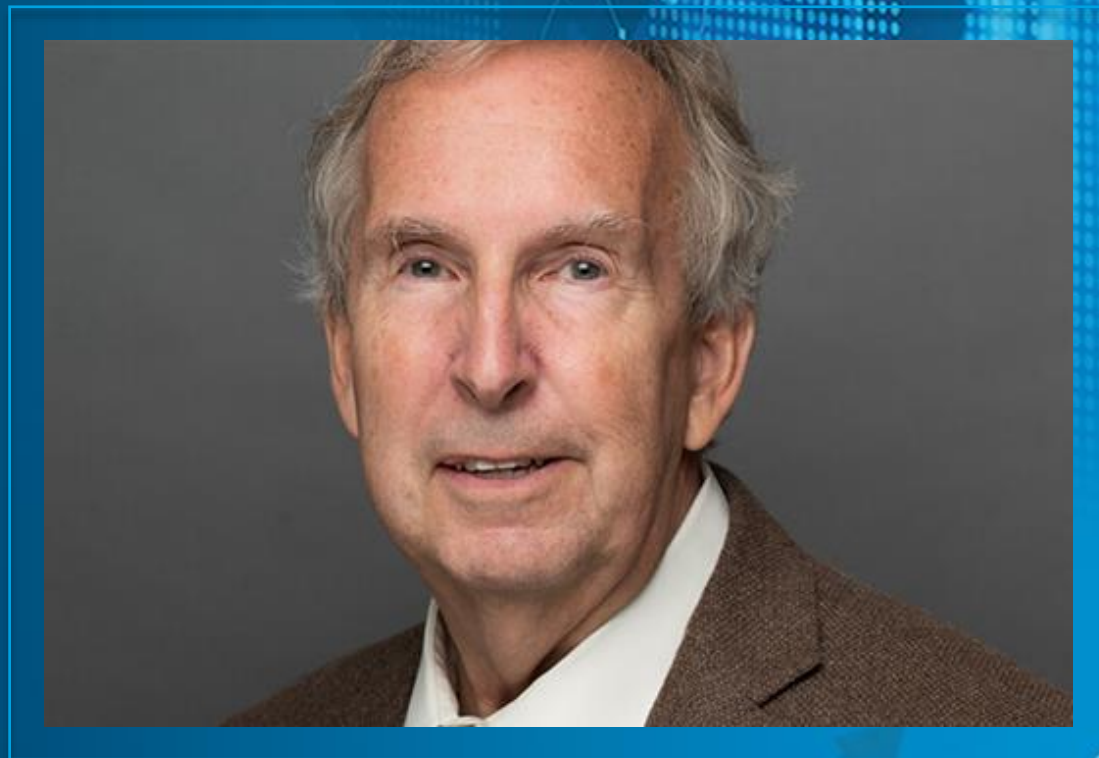
News from Sources

- Major e-commerce retailer delay in construction due to “uncertain economy” on their second HQ in Arlington, VA.
- Search engine technology company cancels plans for Kirkland, WA campus, citing the need to ensure real estate investments meet current and future market needs.
- 33-story major-brand hotel in Orlando, FL, is on hold. The developer of that project told our team that the Silicon Valley Bank collapse in California has impacted their funding. Various banks are not loaning \$100 million+ loans.



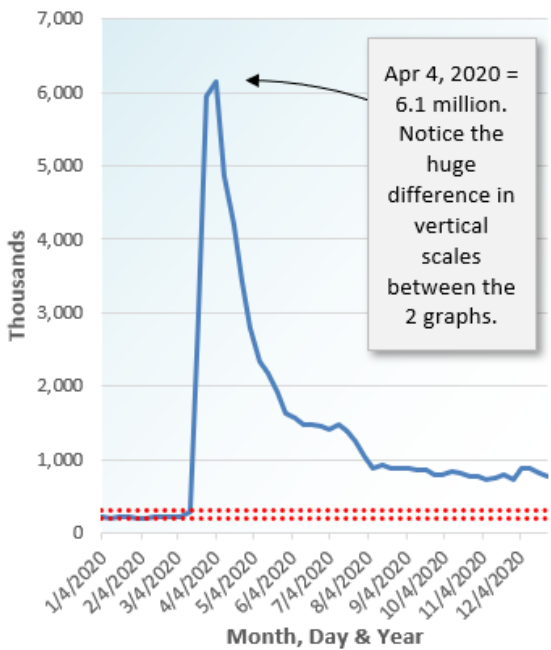
Alex Carrick

Chief Economist,
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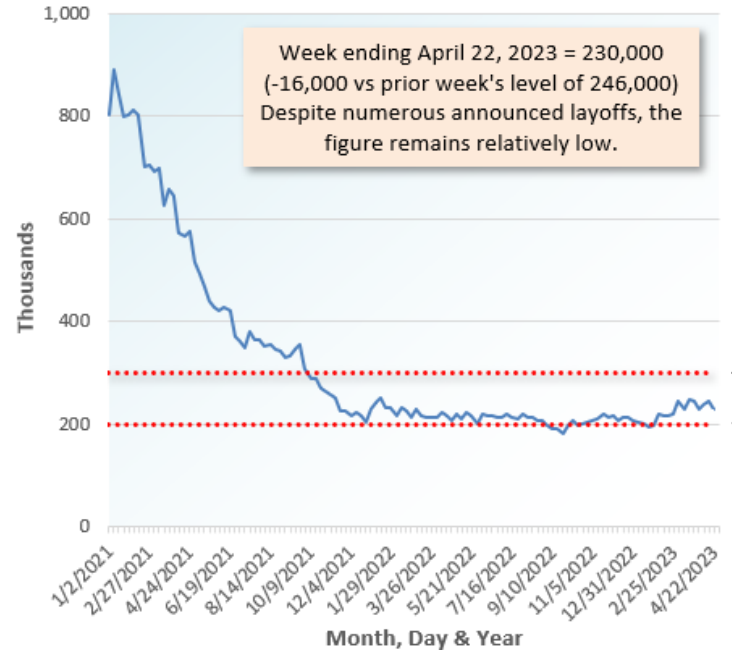


U.S. INITIAL JOBLESS CLAIMS WEEKLY – AS OF APRIL 22, 2023

2020 (Highlighting the Spring Pandemic Spike)



From Beginning of 2021 On



The 'sweet zone' lies between 300,000 & 200,000. Near 200,000 or less, the labor market is really tight. **But a rising figure, depending on how severely, will warn of an economic slowdown, or even recession.**

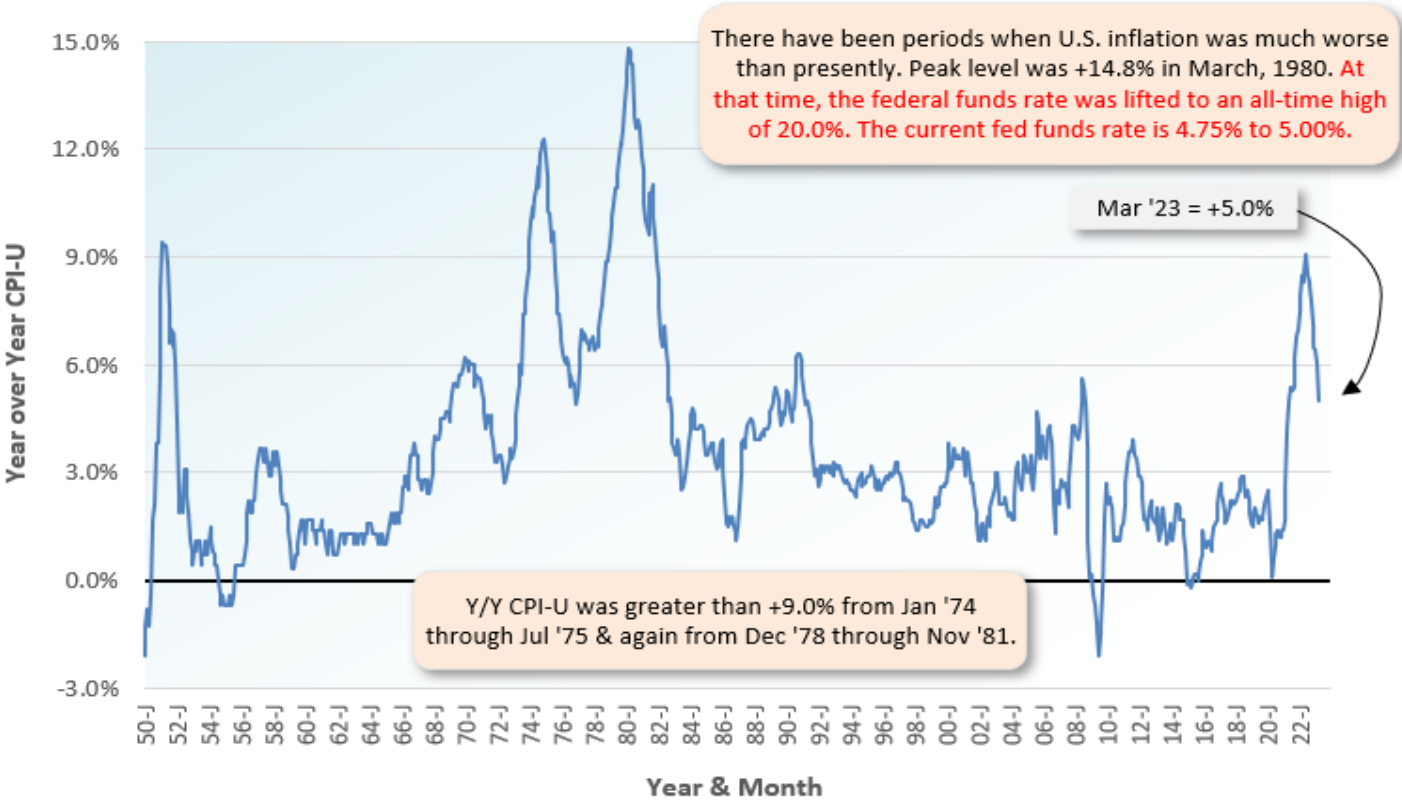
....

The ongoing UI claims number is now +569,000 versus its low point of 1.289 million for Sept 10, 2022.

The metric on the count of individuals continuing to receive unemployment insurance is a week behind the initial jobless claims number. **For April 15, ongoing claims were 1.858 million, a decrease of -3,000 compared with the previous week's 1.861 million.** Before the pandemic, the figure was consistently below 2.0 million. It's been back under (and mostly well under) 2.0 million for 72 weeks in a row. Ongoing claims were at their highest, 23.1 million, on May 9, 2020.

Data source: Department of Labor & Census Bureau / Chart: ConstructConnect-CanaData.

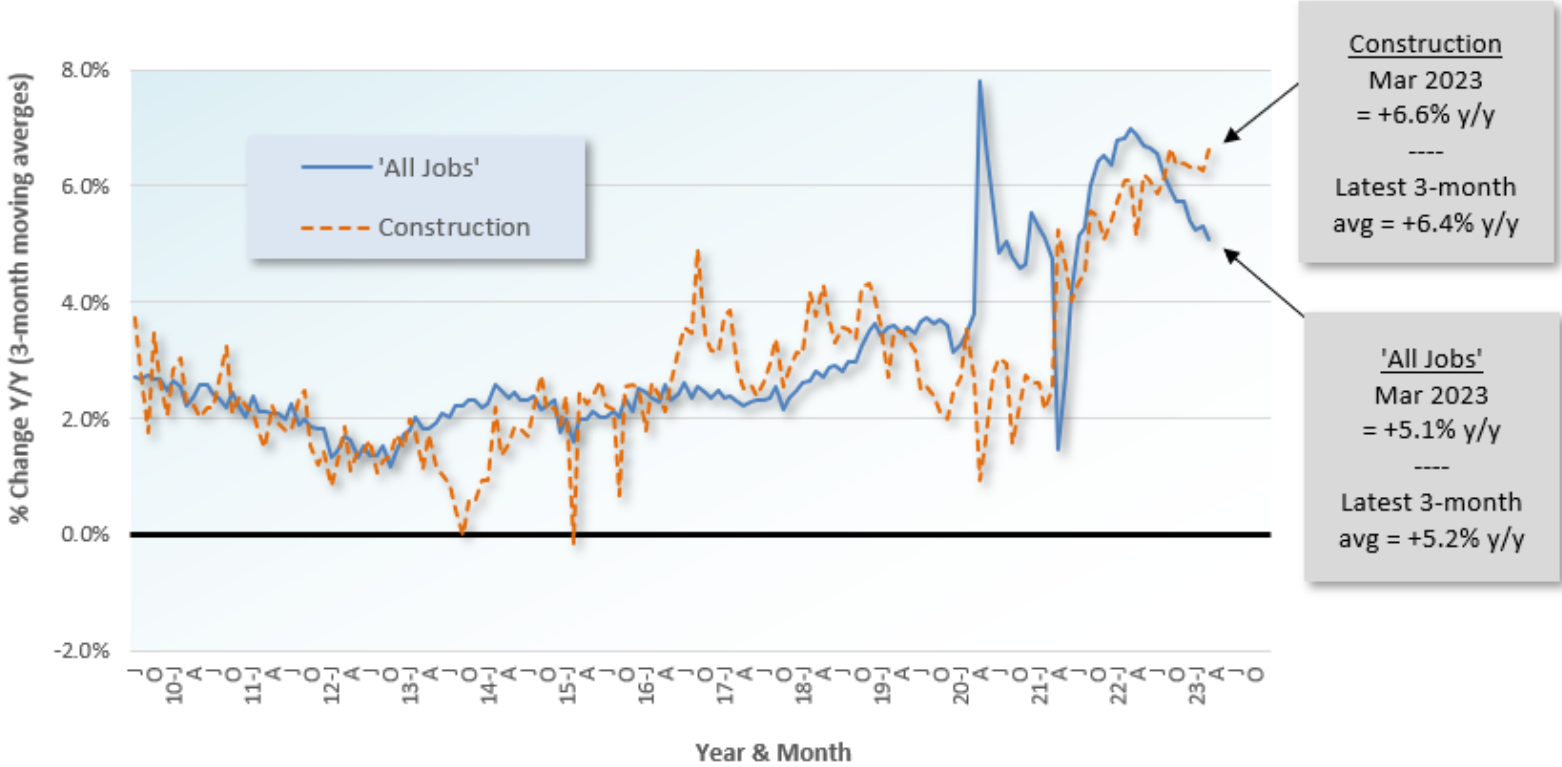
U.S. INFLATION HISTORY – CPI-U Y/Y



'Food at home' (+8.8% y/y) is finally under double digits. The 'gasoline' sub-index is currently -17.4% y/y. The 'used cars & trucks' sub-index, -11.2% y/y; and 'rent', +8.8% y/y.

Data source: U.S. Bureau of Labor Statistics (BLS) /
Chart: ConstructConnect-CanaData

U.S. AVERAGE HOURLY EARNINGS Y/Y – 'ALL JOBS' & CONSTRUCTION



Y/y advances in hrly wages for 'all jobs' are in line with inflation (+5.0% for 'all items'; +5.6% for 'core'); construction, though, is charging ahead faster. Avg y/y hrly wage gains for construction workers, 2010-2019, were +2.3%; for 'all jobs', +2.4% .

From 'Production Workers and Non-supervisory Personnel' Table B8.
 Data source: Bureau of Labor Statistics (BLS)'s *Employment Situation* report / Chart: ConstructConnect-CanaData.

U.S. 2022 MEGA PROJECT 'STARTS' STORY

Month	State	City/County	Type	Name	\$s (millions)	
Jan 2022	New York	East Hampton	Engineering/Civil	South Fork Wind Farm	\$2,000	1 for \$2.0 billion
April 2022	Maine	Kittery	Institutional	P-381 Multi-Mission Dry Dock 1, Portsmouth Naval Shipyard	\$1,700	
April 2022	New Jersey	Kearny	Engineering/Civil	Portal North Bridge Project	\$1,600	
April 2022	Louisiana	Sulphur	Industrial	Tellurian Driftwood Liquefied Natural Gas (LNG) Production & Export Facility - Phase 1	\$10,000	
April 2022	California	Cupertino	Residential	The Rise Mixed-Use, Sand Hill Property Co. (3.9 million sf)	\$2,700	
April 2022	California	Sacramento	Institutional	Aggie Square Mixed-Use Project Phase 1 - University of California, GMH Associates	\$1,100	5 for \$17.1 billion
May 2022	New York	New York	Commercial	Terminal 4 (T4) Redevelopment (10 New Gates), JFK Airport	\$1,500	
May 2022	Pennsylvania	Philadelphia	Institutional	New Inpatient Tower - Children's Hospital of Philadelphia (2.5 million sf)	\$1,900	
May 2022	Indiana	Indianapolis	Institutional	IU Health Methodist Hospital - Hospital Consolidation, Indiana University Health (IUH)	\$1,600	
May 2022	Texas	Sherman	Industrial	Texas Instruments Semiconductor Wafer Fabrication Plants (4.7 million sf)	\$15,000	4 for \$20.0 billion
June 2022	Florida	Apopka	Industrial	Apopka 429, Blue Steel Dev LLC (2.5 million sf)	\$1,000	
June 2022	Kentucky	Glendale	Industrial	BlueOvalSK Battery Park - Ford Motor Company (5.0 million sf)	\$5,800	
June 2022	Texas	Beaumont	Engineering/Civil	Arbor Renewable Gas Facility - Spindletop Plant	\$1,000	3 for \$7.8 billion
July 2022	Massachusetts	Boston	Residential	Bunker Hill Housing Redevelopment (fka One Charlestown) (2.8 million sf)	\$1,400	
July 2022	Pennsylvania	Pittsburgh	Institutional	Heart & Transplant Hospital at UPMC Presbyterian - U of Pittsburgh Medical Center	\$1,500	
July 2022	Michigan	Lansing	Industrial	General Motors Battery Cell Manufacturing Plant (2.5 million sf)	\$7,000	
July 2022	Texas	Baytown	Industrial	TGS 500K, Trans-Global Solutions	\$1,400	
July 2022	California	Paramount	Industrial	World Energy Paramount Sustainable Fuel Refinery Upgrades	\$2,000	5 for \$13.3 billion
Sept 2022	Texas	Taylor	Industrial	Samsung Semiconductor Chipmaking Plant (6.0 million sf)	\$9,000	
Sept 2022	Texas	San Antonio	Engineering/Civil	I-35 NEX Central Project (Texas Dept of Transport)	\$3,000	
Sept 2022	Arizona	Litchfield Park	Industrial	Prologis 303 (Loop 303) Industrial Park (1.6 million sf)	\$1,000	
Sept 2022	California	Torrance	Institutional	Harbor-UCLA Medical Center Replacement Program (1.3 million sf)	\$1,200	4 for \$14.2 billion
October 2022	Massachusetts	Boston	Institutional	Massachusetts General Hospital / Clinical & Campus Services Bldg (1.1 million sf)	\$1,900	
October 2022	Georgia	Savannah	Industrial	Hyundai Motors Electric Vehicle & Battery Mnfg Plant (11 Buildings) (14.0 million sf)	\$5,500	
October 2022	Texas	Beaumont	Industrial	OCI Beaumont Blue Ammonia Facility	\$2,000	3 for \$9.4 billion
November 2022	Texas	Odessa	Industrial	1PointFive Direct Air Carbon Capture Plant, with Occidental Pete (1.5 million sf)	\$1,100	
November 2022	Nevada	Las Vegas	Engineering/Civil	The Gemini Solar Array, Quinbrook Infrastructure Partners/Rowan Green Data	\$1,000	2 for \$2.1 billion
December 2022	New York	Albany	Engineering/Civil	Champlain Hudson Power Express Project (underground cable, Canada to New York)	\$4,500	
December 2022	Tennessee	Stanton	Industrial	Blue Oval City Manufacturing Facility - Ford Motor Company (7.5 million sf)	\$5,600	
December 2022	Arizona	Phoenix	Industrial	Taiwan Semiconductor Manufacturing Company (TSMC) - Fab 2 (2.5 million sf)	\$8,000	
December 2022	Arizona	Buckeye	Industrial	KOREPlex Manufacturing Facility (batteries), KORE Power Inc (2.0 million sf)	\$1,300	4 for \$19.4 billion

Data source and table: ConstructConnect.

2022's Totals = 31 for \$105.3 billion

U.S. Q1 2023 MEGA PROJECT 'STARTS' STORY

Month	State	City/County	Type	Name	\$s (millions)	
January 2023	Indiana	Indianapolis	Institutional	New Indy Hospital Project - Indiana University Health (2.0 million sf)	\$1,600	
January 2023	Alabama	Bay Minette	Industrial	Novelis Corp Low-carbon Aluminum Recycling and Rolling Plant (2.5 million sf)	\$2,500	
January 2023	Texas	Port Arthur	Industrial	Sempra Energy - Liquefied Natural Gas Export Terminal - Phase 1 Trains 1 & 2	\$10,500	3 for \$14.6 billion
February 2023	New York	New York	Commercial	John F. Kennedy International Airport Terminal 6 Expansion (1.2 million sf)	\$2,600	
February 2023	California	Riverside	Engineering/Civil	Desert Quartzite Solar Project, First Solar Inc	\$1,000	2 for \$3.6 billion
March 2023	Ohio	Washington Cou	Industrial	Honda & LG Energy Solutions - Battery Plant Development (2.0 million sf)	\$3,500	
March 2023	Alaska	Prudhoe Bay	Engineering/Civil	Pikka North Slope Oil Project, Santos/Oil Search (Alaska) LLC	\$3,000	2 for \$6.5 billion

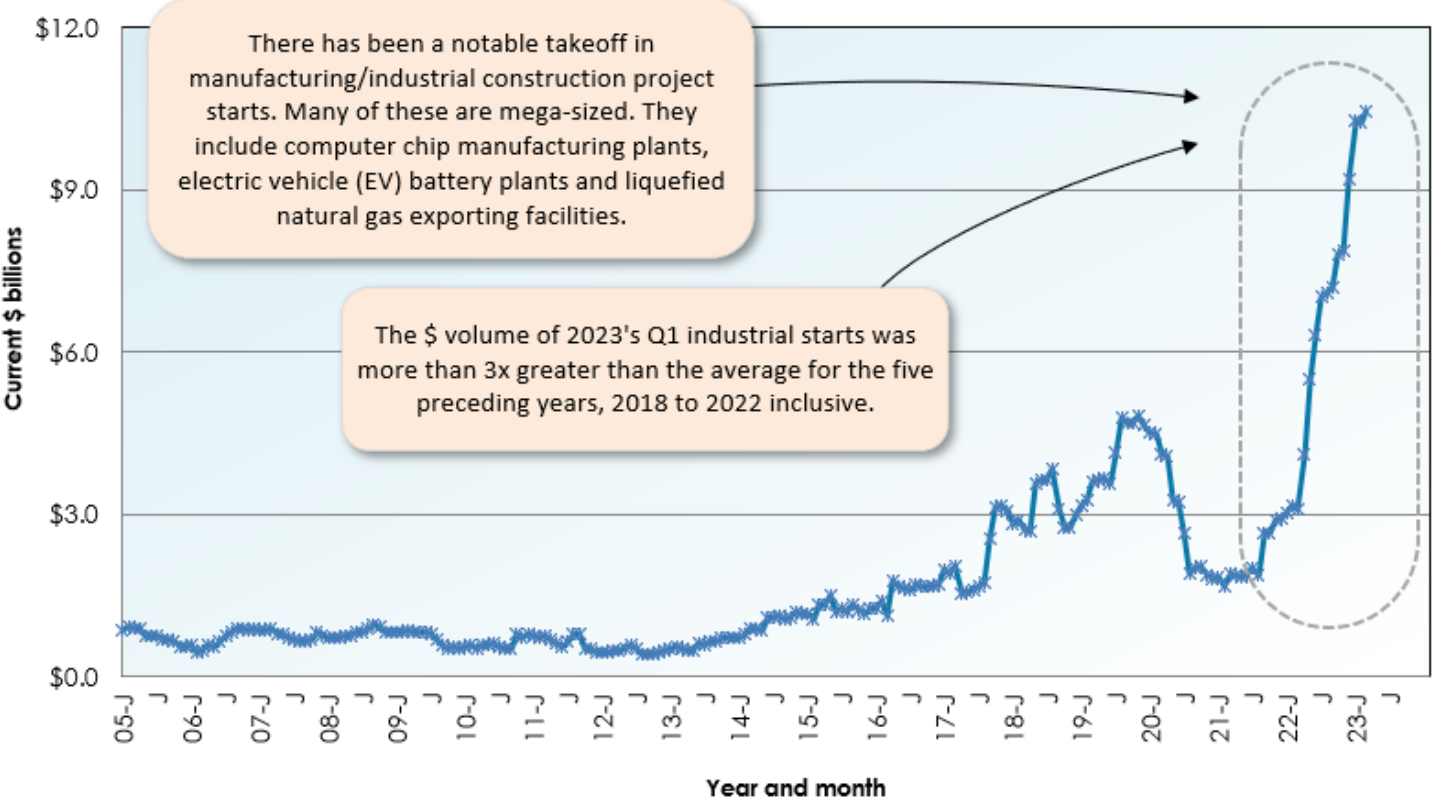
Data source and table: ConstructConnect.

2023's Q1 Totals 7 for \$24.7 billion

IMPLICATIONS OF AN ABUNDANCE OF MEGAPROJECTS

1. A source of solid economic activity locally for years, with follow-up benefits once the project has been commissioned and is in operation
2. Ties up winning general and subcontractors and takes them out of future bidding processes
3. Offers better wages and jobs stability for workers who are signed on to do the work
4. May encourage owners to establish their own in-house workforces
5. Regular/annual maintenance work on such projects is often extensive, involving way more skilled manpower than is often supposed (which siphons off workers from new construction).

U.S. MANUFACTURING/INDUSTRIAL CONSTRUCTION STARTS - CONSTRUCTCONNECT (12-MONTH MOVING AVERAGES)



The last data point is for March, 2023.

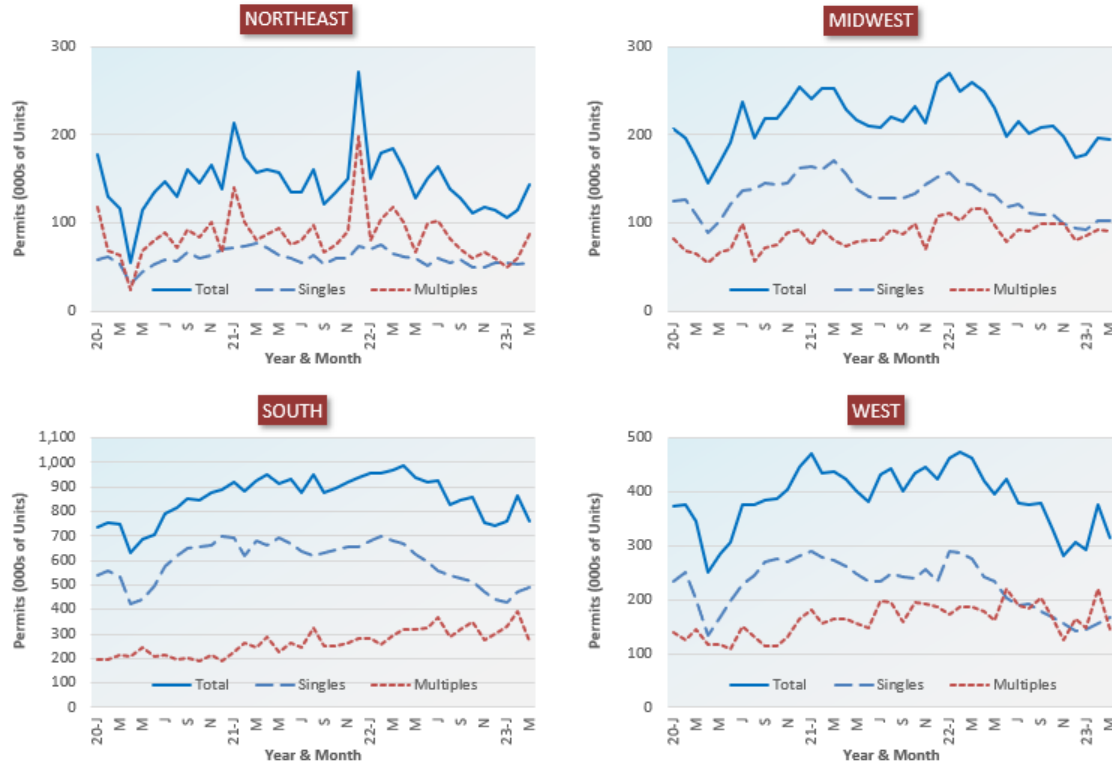
Data source: ConstructConnect.
Graph: ConstructConnect.

A SHORTHAND WAY OF UNDERSTANDING THE MAJOR CAPITAL SPENDING

Consider how fossil fuels are used in production processes and what the opportunities are for their replacement by nonpolluting substitutes. Doing so will no doubt be expensive.

- **Cement & ready-mix:** replace coal/other fossil fuels as the heat source in the mixing process with renewable and replace diesel fuel for locomotion and turning the drum in ready-mix trucks
- **Aluminum:** reduction of bauxite through electrolysis, with power coming from renewable sources
- **Steelmaking:** replace coking coal in BOF production with hydrogen (pilot project in Sweden) OR EAFs where the electricity to melt scrap steel and iron comes from a renewable source
- **Glassmaking:** 24/7 heat to originate with hydrogen as opposed to fossil fuels (pilot project Germany)
- **Lumber:** Sawmills to draw on their own remote-site hydroelectric or biomass (sawdust) sources
- **Hydrogen:** derive green hydrogen by separating H₂ atoms from O atom (oxygen) in water through electrolysis (where the power source is wind, solar, geothermal, hydroelectric, or nuclear)

U.S. RESIDENTIAL BUILDING PERMITS ISSUED (UNITS) - BY REGION SINCE JANUARY 2020, JUST BEFORE THE ONSET OF THE COVID PANDEMIC



Only in the NE have permits (in units) for multiples been consistently higher than for singles. Across regions, declines in number of permits for singles have brought about convergence, or near convergence, with multi-family permits.

Latest data points (seasonally adjusted) are for March 2023. Data source: Census Bureau / Chart: ConstructConnect-CanaData.

HOUSING STARTS – UNITS IN MULTI-FAMILY STRUCTURES AS % OF TOTAL* UNITS – 36 MOST POPULOUS U.S. CITIES - 2022

More than 1/2 of units are Multis vs Singles		Less than 1/2 of units are Multis vs Singles	
New York	78.8%	St. Louis	49.2%
Seattle	73.8%	Tampa	47.7%
Boston	72.6%	San Jose	45.5%
San Francisco	70.6%	Philadelphia	45.4%
Los Angeles	66.3%	Atlanta	44.1%
Miami-Ft Laud	66.3%	Orlando	43.9%
Washington DC	63.9%	Dallas-Ft Worth	43.8%
Minneapolis-St. Paul	63.5%	Phoenix	43.4%
San Diego	62.7%	Detroit	41.2%
San Antonio	57.6%	Houston	37.1%
Denver	57.0%	Indianapolis	36.8%
Baltimore	56.9%	Cincinnati	34.3%
Columbus	54.3%	Charlotte	30.1%
Portland	54.3%	Las Vegas	29.6%
Austin	52.8%	Riverside	25.3%
Kansas City	52.6%	Pittsburgh	25.2%
Chicago	51.8%	Sacramento	24.1%
		Nashville	18.8%
		Cleveland	14.3%

Whether the type of residential construction is more single-family oriented vs multi-family has a profound impact on other kinds of construction. The former (e.g., suburbs) favors roadwork, sewers & watermains, K-12 educational facilities, big and small shopping malls, and commuter transit systems; the latter leans towards mixed-use commercial, existing building conversions for fire halls, etc., and rapid transit (subways, LRT systems).

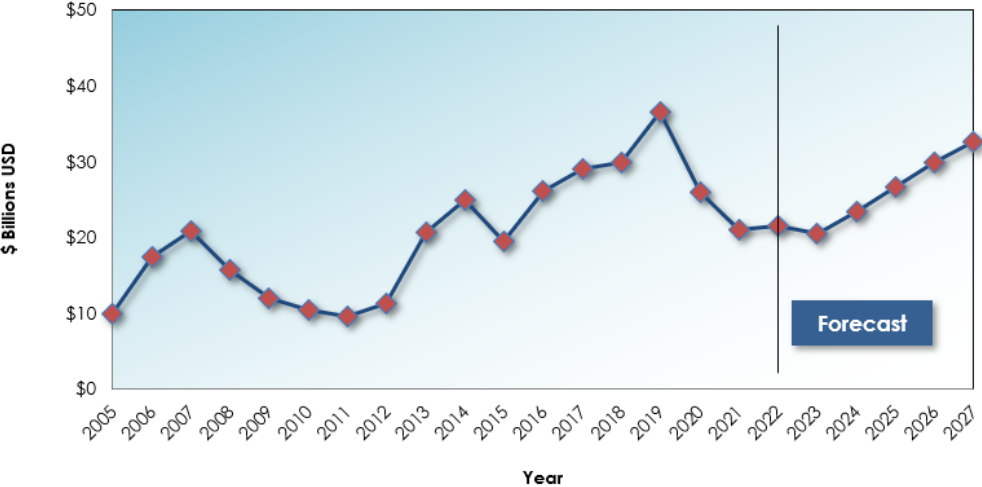
*Total is single-family plus multi-family units. Data source (permits as proxy for starts): Census Bureau / Table: ConstructConnect.

U.S. TYPE-OF-STRUCTURE CONSTRUCTION 'STARTS' FORECASTS (\$ BILLIONS USD) - SUMMER 2023

Main Categories:	Actuals		Forecasts				
	2021	2022	2023	2024	2025	2026	2027
Residential	362.5	366.7	322.7	350.2	396.1	438.5	478.0
(Yr/yr % change)	20.3%	1.2%	-12.0%	8.5%	13.1%	10.7%	9.0%
Commercial	107.8	116.5	118.8	129.6	142.1	153.0	162.9
(Yr/yr % change)	5.1%	8.1%	2.0%	9.1%	9.7%	7.6%	6.5%
Industrial (Manufacturing)	35.1	110.4	95.2	88.0	86.0	85.0	87.0
(Yr/yr % change)	61.4%	214.7%	-13.7%	-7.6%	-2.3%	-1.2%	2.3%
Institutional	113.8	136.4	144.4	150.0	158.2	165.4	171.6
(Yr/yr % change)	-4.6%	19.8%	5.9%	3.9%	5.4%	4.5%	3.8%
TOTAL NON-RES BLDG	263.0	371.1	365.3	375.0	394.0	411.4	430.0
(Yr/yr % change)	5.5%	41.1%	-1.6%	2.7%	5.1%	4.4%	4.5%
Engineering	156.5	199.1	221.2	236.0	251.4	265.5	276.9
(Yr/yr % change)	1.1%	27.3%	11.1%	6.7%	6.5%	5.6%	4.3%
GRAND TOTAL	782.0	937.0	909.2	961.1	1,041.5	1,115.5	1,184.9
(Yr/yr % change)	10.8%	19.8%	-3.0%	5.7%	8.4%	7.1%	6.2%
Some Important Sub-categories:							
Shopping/Retail	12.9	15.2	15.6	17.1	19.6	22.1	24.8
(Yr/yr % change)	4.9%	17.7%	2.6%	9.7%	14.9%	12.5%	12.4%
Private Offices	21.0	21.4	20.5	23.4	26.7	29.8	32.6
(Yr/yr % change)	-19.1%	2.2%	-4.3%	14.1%	14.0%	11.9%	9.4%
Warehouses	28.2	28.7	23.1	26.7	29.3	30.8	32.2
(Yr/yr % change)	7.7%	1.5%	-19.6%	15.8%	9.8%	5.0%	4.5%
Hospitals/Clinics	18.7	25.9	27.6	28.5	29.5	30.0	31.0
(Yr/yr % change)	40.3%	38.2%	6.7%	3.2%	3.5%	1.6%	3.4%
Educational Facilities	59.9	73.9	76.8	79.0	82.3	85.7	88.4
(Yr/yr % change)	-11.3%	23.4%	4.0%	2.9%	4.2%	4.2%	3.2%
Roads	67.4	83.7	90.7	94.9	100.9	107.1	111.7
(Yr/yr % change)	5.9%	24.2%	8.4%	4.7%	6.3%	6.1%	4.3%
Water & Sewage Treatment	33.9	43.4	43.2	45.8	49.3	52.0	54.3
(Yr/yr % change)	8.4%	28.1%	-0.5%	6.1%	7.5%	5.6%	4.3%
Misc Civil (Power, etc.)	23.5	27.4	41.6	47.3	50.2	52.7	54.9
(Yr/yr % change)	3.3%	16.5%	52.0%	13.7%	6.1%	5.0%	4.3%

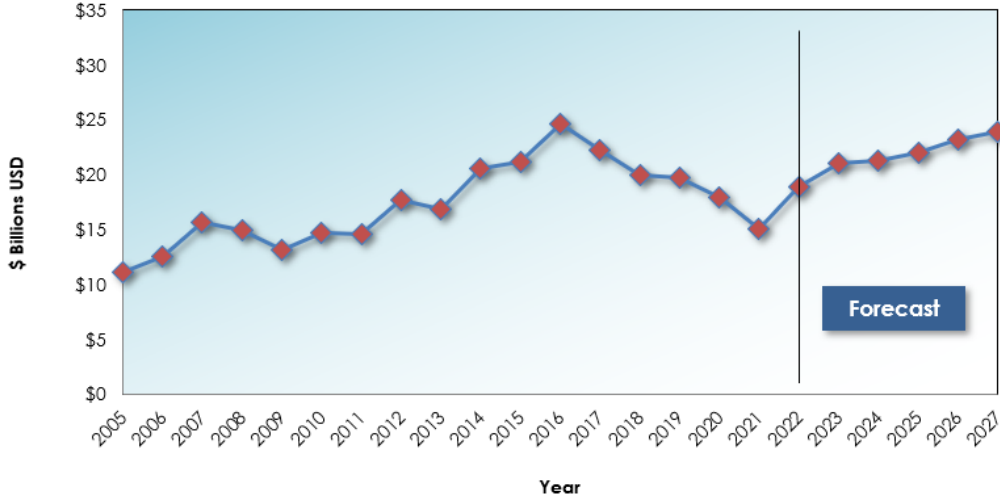
Source of actuals: ConstructConnect "Insight" / Forecasts: Oxford Economics and ConstructConnect / Chart: ConstructConnect.

U.S. Private Office Building Construction Starts



Source of actuals: ConstructConnect "Insight" / Forecasts: Oxford Economics and ConstructConnect
Chart: ConstructConnect

U.S. College and University Construction Starts



Source of actuals: ConstructConnect "Insight" / Forecasts: Oxford Economics and ConstructConnect
Chart: ConstructConnect

LARGE STADIUM PROJECTS IN THE WORKS

All Net Arena and Resort	Las Vegas	\$2,700,000,000	Schematic Design
Downtown South and MLS Stadium Complex	Raleigh	\$2,200,000,000	Design Development
New Tennessee Titans Stadium	Nashville	\$2,100,000,000	Schematic Design
New Kansas City Royals Stadium / Jackson County	Kansas City	\$2,000,000,000	Pre-Design
New Buffalo Bills Stadium	Buffalo	\$1,350,000,000	Pre-Design
Philadelphia 76ers New Stadium	Philadelphia	\$1,300,000,000	Schematic Design
Beckham's Miami Freedom Park - Major League Soccer Stadium	Miami	\$1,000,000,000	Design Development
Soldier Field Improvement Project	Chicago	\$1,000,000,000	Pre-Design
TIAA Bank Field Renovation - City of Jacksonville	Jacksonville	\$1,000,000,000	Schematic Design
Ryan Field Stadium at Northwestern University	Evanston	\$800,000,000	Pre-Design
New York City FC Stadium - Willets Point	New York	\$780,000,000	Pre-Design
Renovation Projects at M&T Bank Stadium	Baltimore	\$600,000,000	Schematic Design
Music City Baseball Stadium	Nashville	\$600,000,000	Schematic Design
Oakland A's Waterfront Ballpark at Howard Terminal	Oakland	\$522,000,000	Schematic Design
Paul Brown Stadium Renovation	Cincinnati	\$500,000,000	Schematic Design

Data source and table: ConstructConnect.

LARGE TRANSIT PROJECTS IN THE WORKS

One Central Project	Chicago	\$20,000,000,000	Schematic Design
Texas Central Railway High-Speed Line	Dallas	\$17,999,999,000	Construct Documents
Second Avenue Subway Phase 3 - MTA - New York City Transit	New York	\$14,200,000,500	Pre-Design
Baltimore Washington Rapid Rail	Baltimore	\$12,000,000,000	Pre-Design
Project Connect Orange Line Station	Austin	\$10,000,000,000	Schematic Design
New Bus Terminal - City of New York	New York	\$3,500,000,000	Schematic Design
Virgin Trains (Formerly The Brightline Express) - Third Phase	Orlando	\$2,000,000,000	Pre-Design
Rapid Mass Transit Solution for the North Corridor - Phase 2	Miami Gardens	\$1,900,000,000	Pre-Design
Valley Link Light Rail Development - Tri-Valley-San Joaquin Valley	Livermore	\$1,800,000,000	Design Development
Glassboro Camden Line - New Jersey Transit Corporation	South Jersey	\$1,800,000,000	Pre-Design
D2 Subway Second CBD Alignment	Dallas	\$1,700,000,000	Pre-Design
Link Union Station Passenger Concourse - L.A. County MTA	Los Angeles	\$1,500,000,000	Design Development
City Center Guideway and Stations Design-build	Honolulu	\$1,400,000,000	Bid Date Set
King of Prussia Light Rail Extension and Stations	King of Prussia	\$1,100,000,000	Design Development
West Seattle to Ballard Extension & Downtown Light Rail Tunnel	Seattle	\$1,000,000,000	Schematic Design

Data source and table: ConstructConnect.

Michael Guckes

Senior Economist,
ConstructConnect



Applied Economics

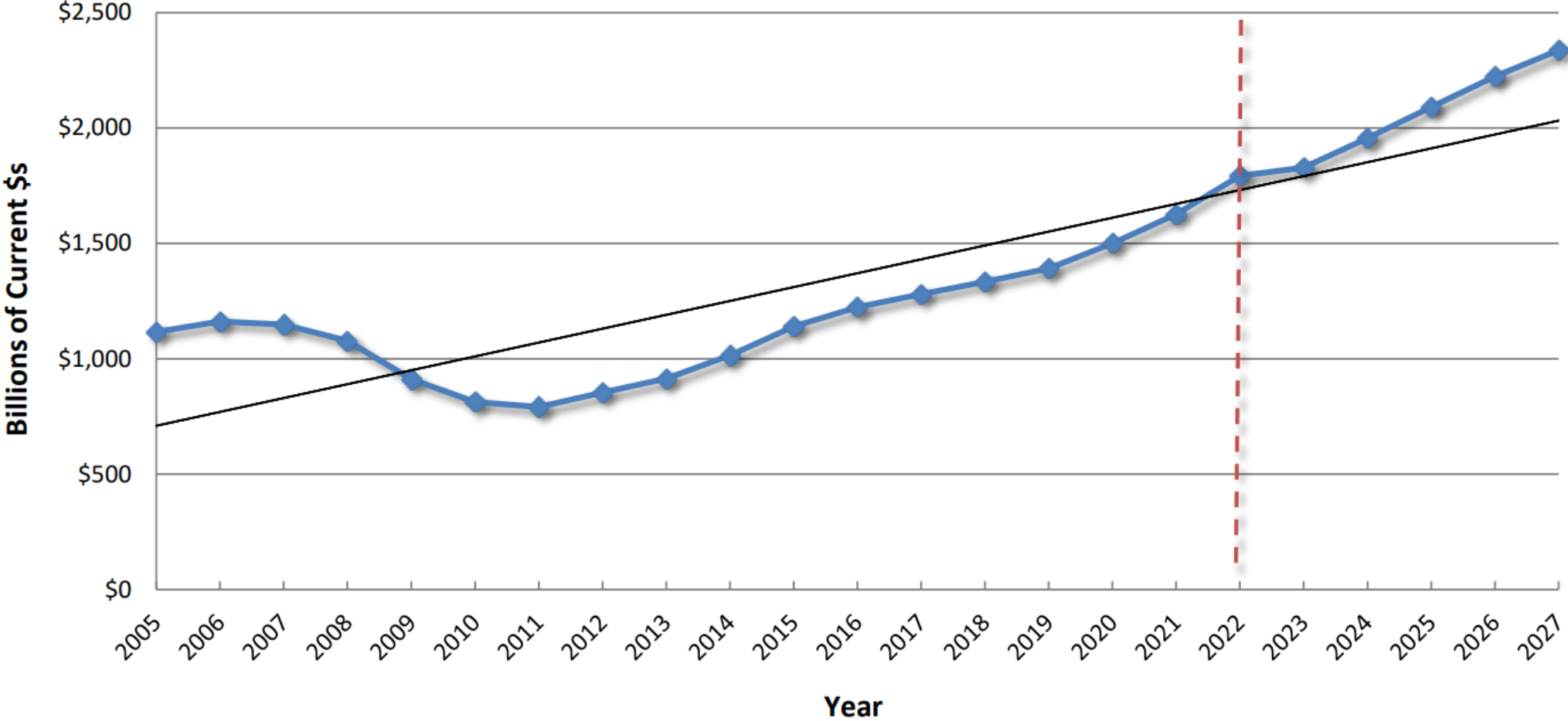
How One Can Use Economics To Drive Business Decisions:

- 1 Put-in-Place Construction Outlook
- 2 Operational Consideration
- 3 Financial Markets and the Construction Firm



Construction Market Overview

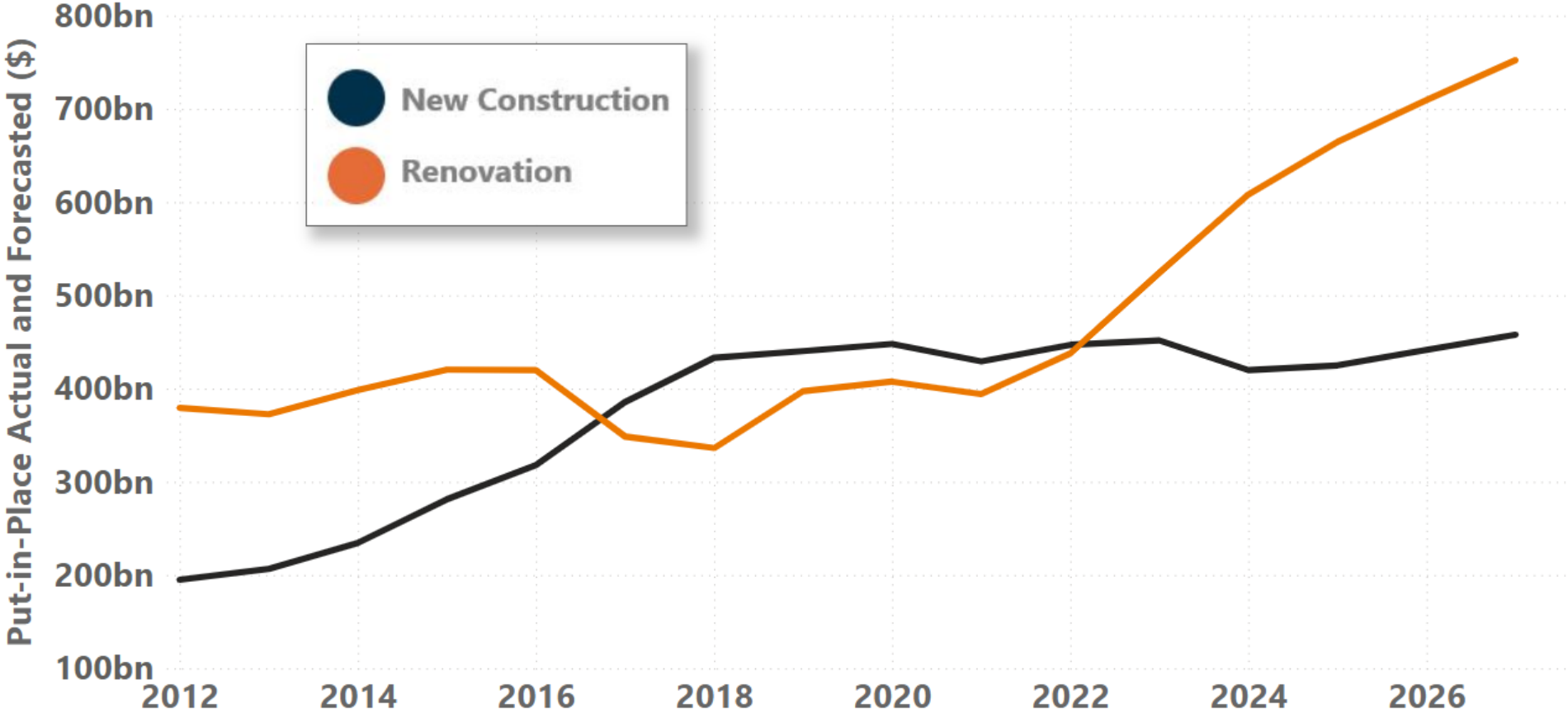
Graph 1: U.S. Grand Total Construction Spending Put-in-place (PIP) Investment



Graph includes a 'best fit' linear trend line.

Put-in-Place Construction, Total Nonresidential

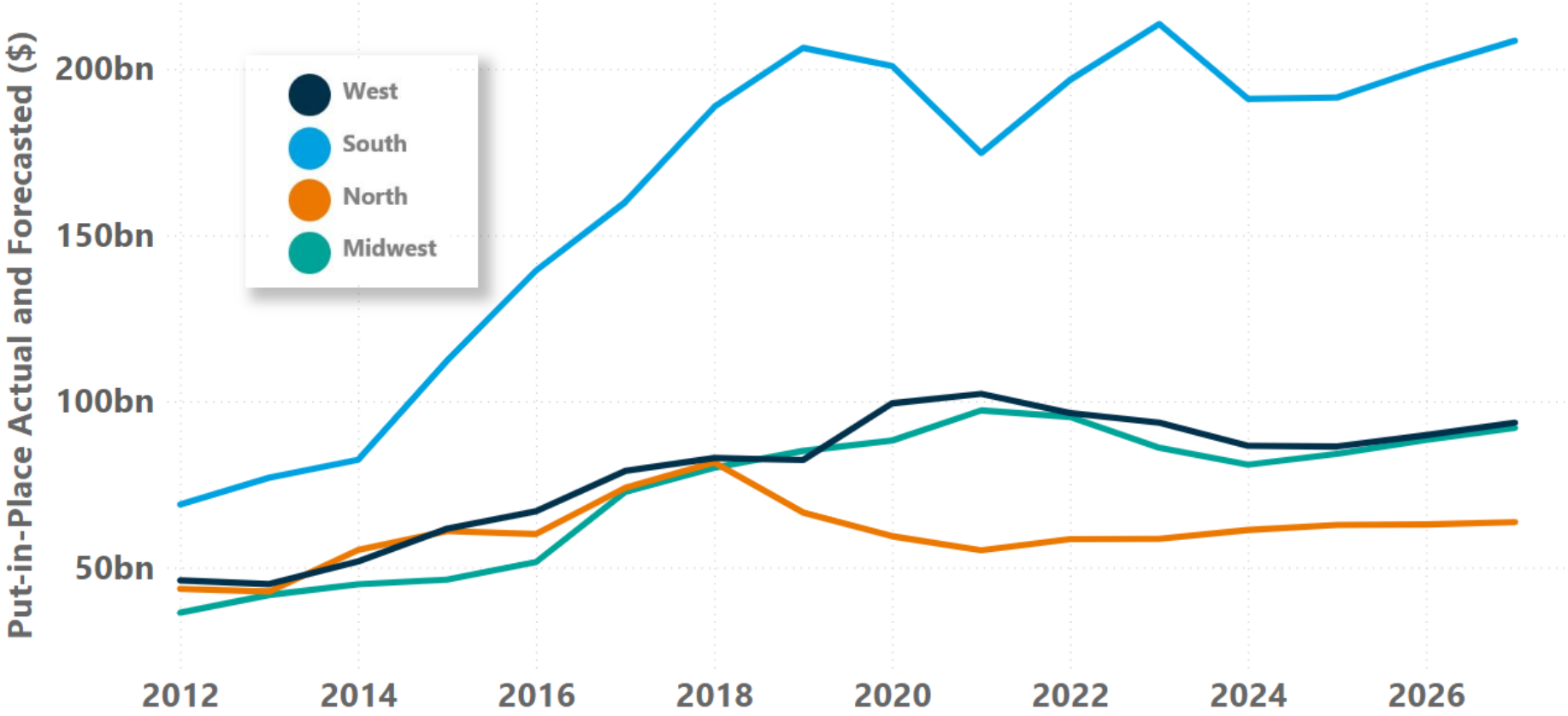
New and Renovation with Forecast through 2027, (nominal \$s)



Source: ConstructConnect, calculations by Oxford Economics

Regional NEW Construction, Put-in-Place

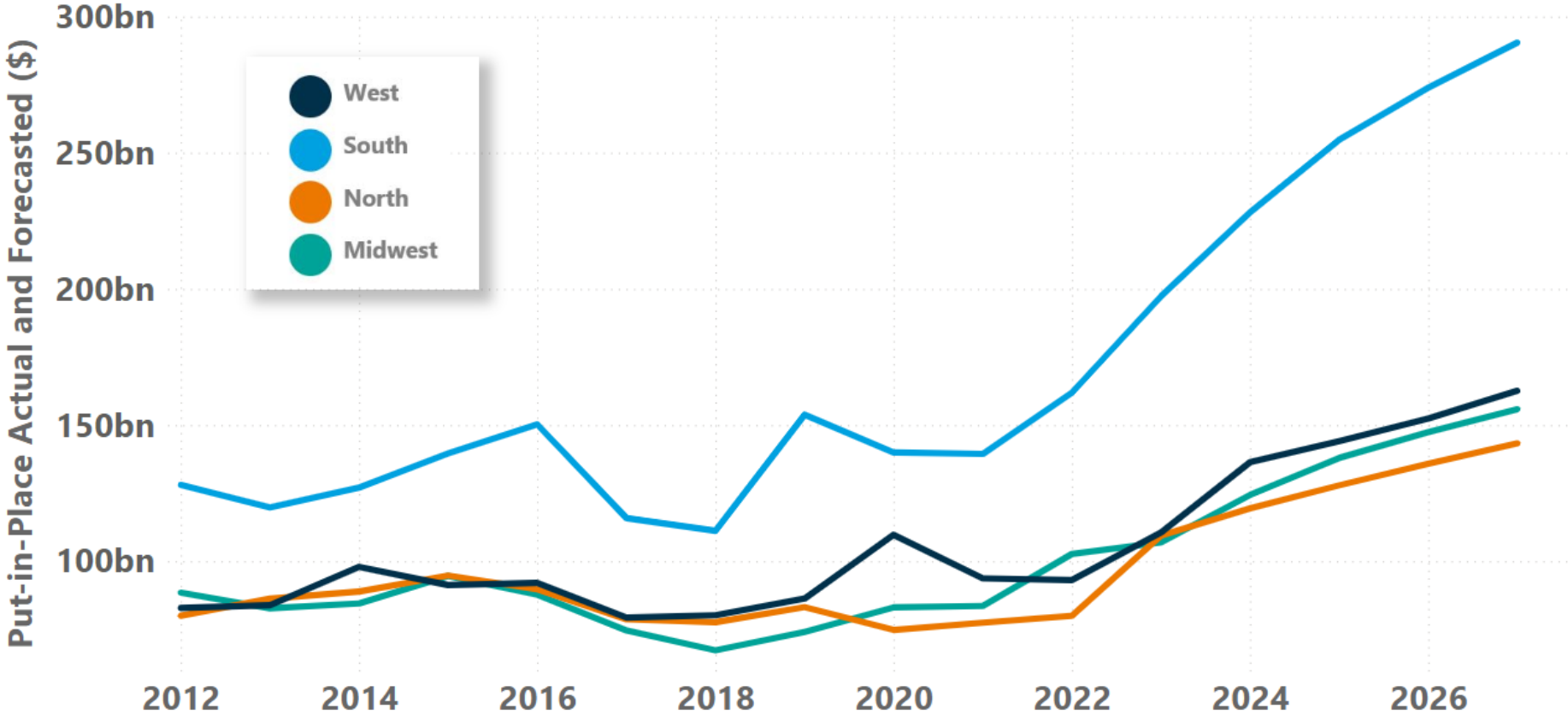
Total Nonresidential with Forecast through 2027, (nominal \$s)



Source: ConstructConnect, calculations by Oxford Economics

Regional RENOVATION Construction, Put-in-Place

Total Nonresidential with Forecast through 2027, (nominal \$s)



Source: ConstructConnect, calculations by Oxford Economics

Project Stress Index: U.S. Civil and Building Projects

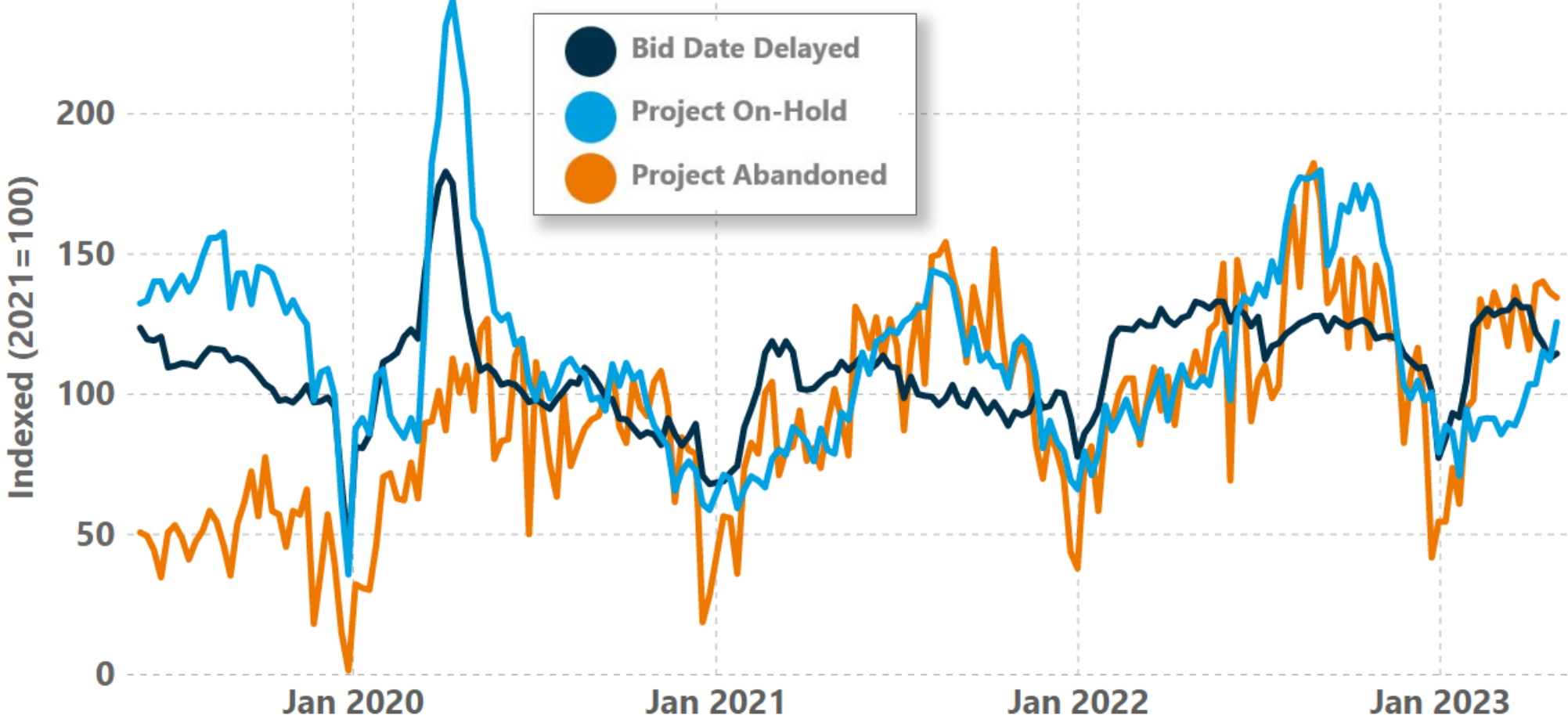
Rolling 30-day rolling average of civil and building construction projects that are delayed, on hold, and abandoned



Source: ConstructConnect, data through April 29, 2023

Project Stress Index: U.S. Civil and Building Projects

Rolling 30-day rolling average of civil and building construction projects that are delayed, on hold, and abandoned



Source: ConstructConnect, data through April 29, 2023

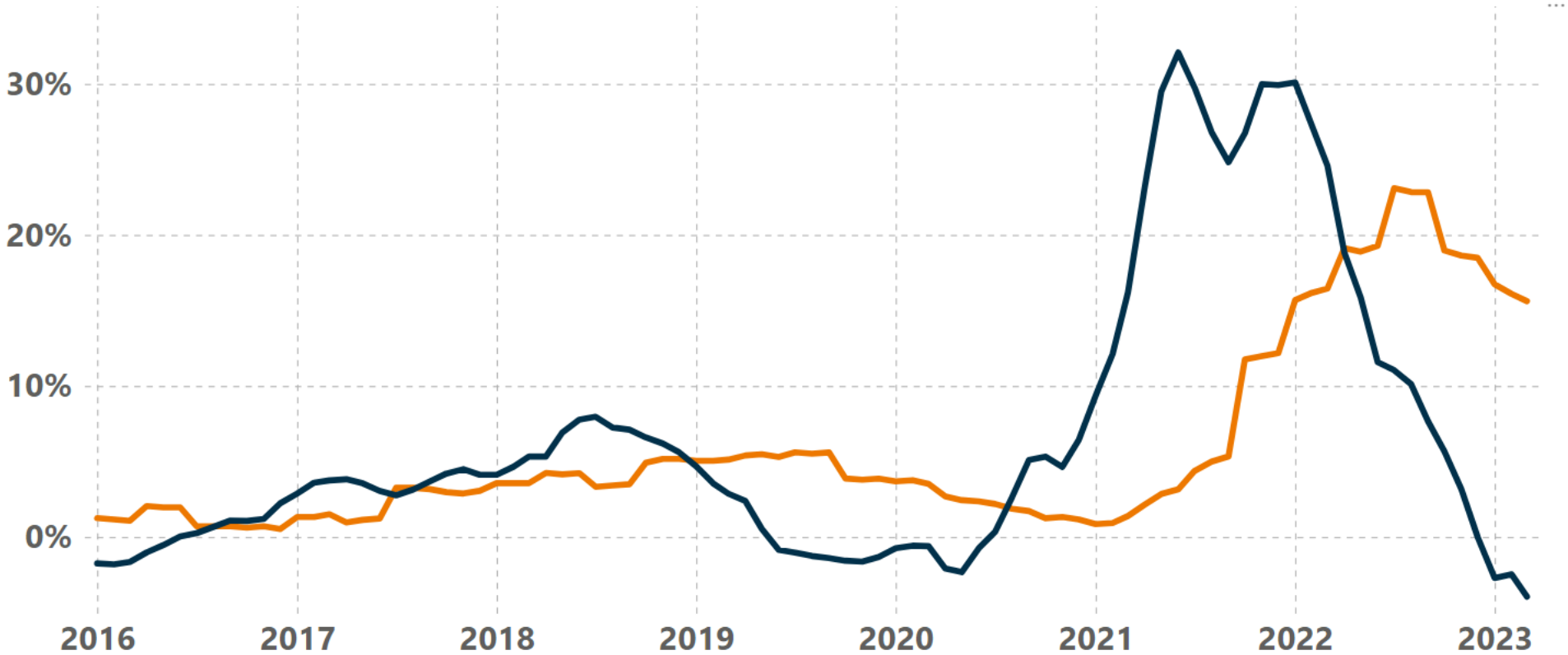
1. Monitor market data that is inflation adjusted and geographically relevant to your company's footprint.
2. Expectations for new construction & additions look different from renovation work.
3. Project stress is elevated from prior-year levels; take necessary precautions.



Operational Considerations

Bid Prices Surpass Cost Increases for First Time Since COVID

Bid prices accelerating faster than material prices for first time since 2020, (Year-on-Year % Change)

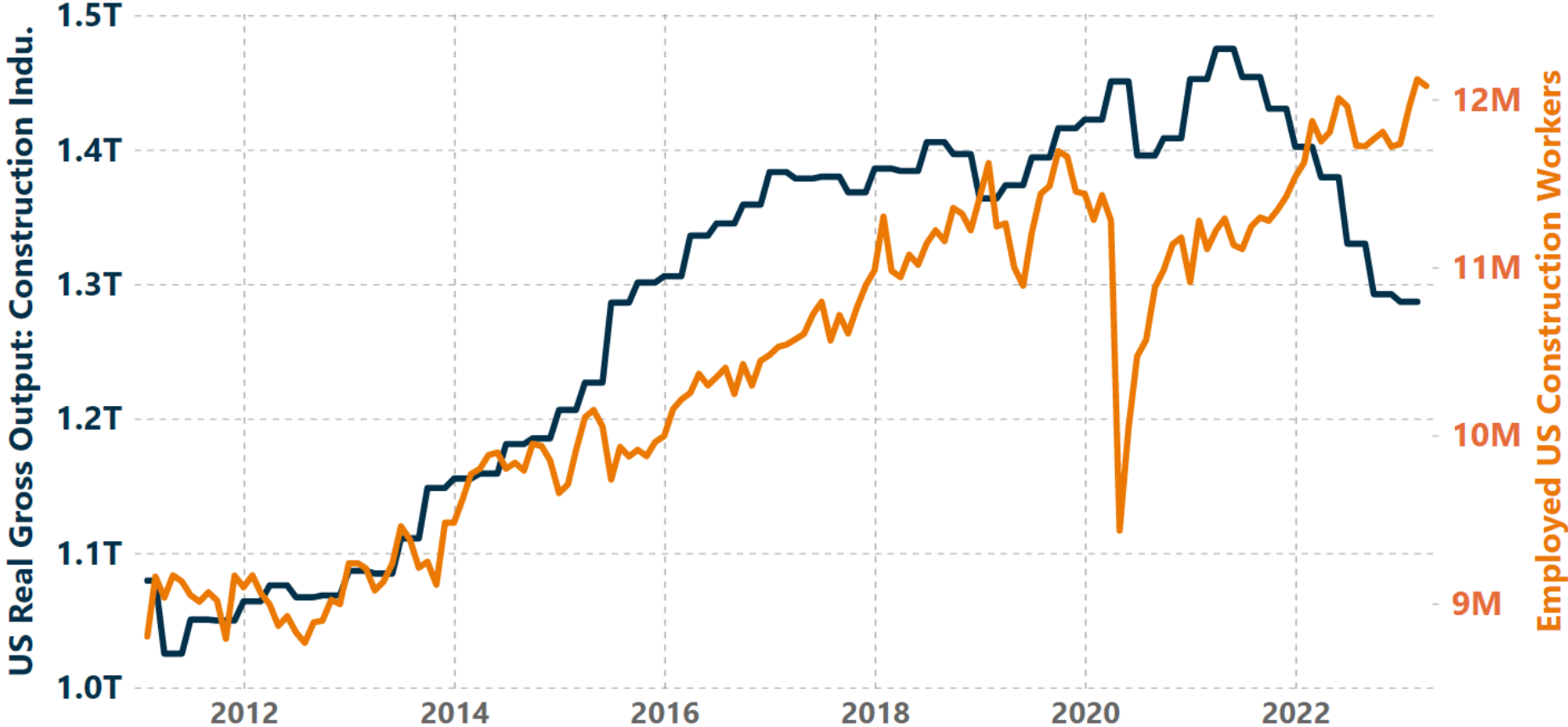


● Final Demand Bid Price Index, YoY% ● ConstructConnect Materials Input Index, YoY%

Sources: Bid Price - Bureau of Labor Statistics, ConstructConnect Custom Analytics

US Real Construction Output Contrasts with Labor Levels

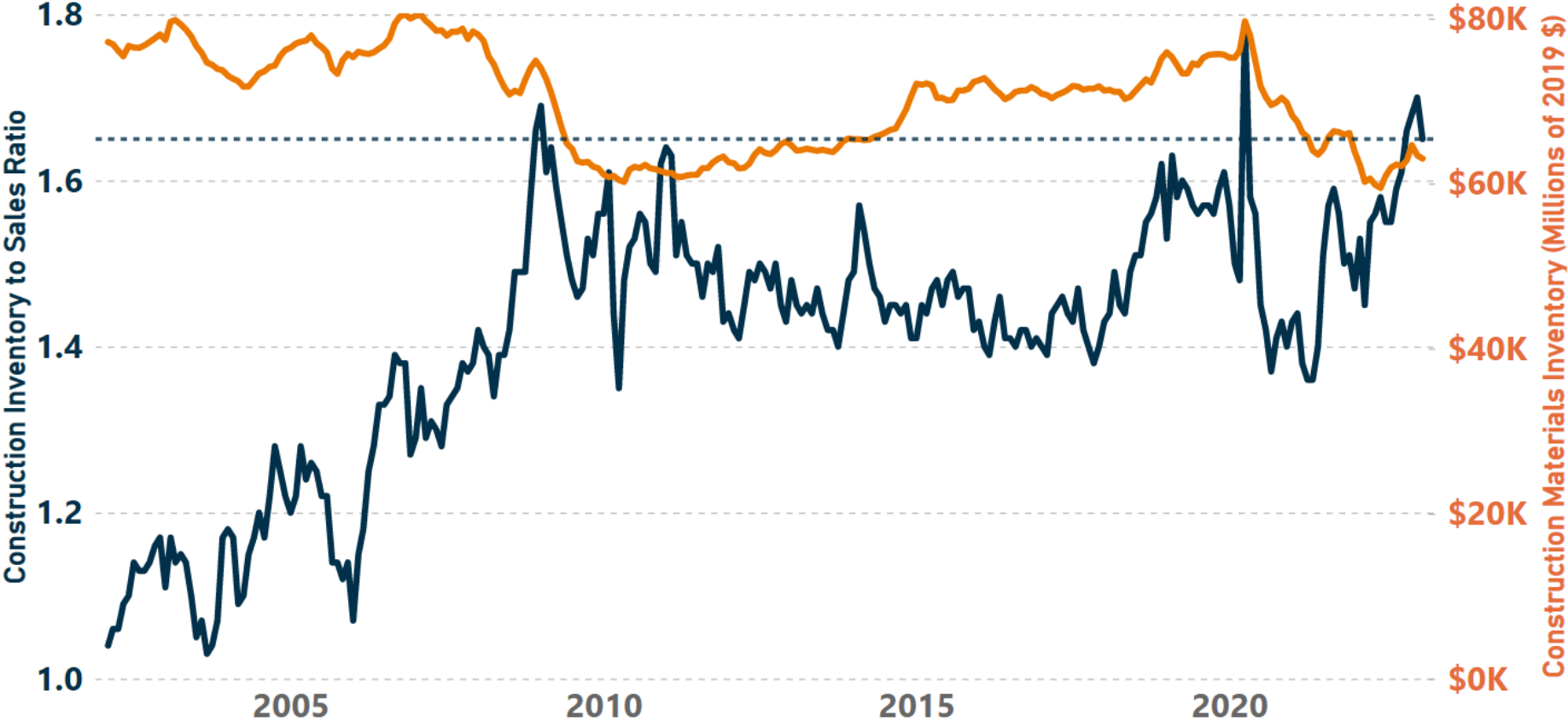
(Inflation adjusted 2012 Chained dollars, seasonally adjusted annual rate)



Source: Output, Bureau of Economic Analysis; Labor, Bureau of Labor Statistics

High Inventories Will Pose a Financial Risk to Firms in 2023

After hoarding inventory during COVID, firms now need inventory discipline as demand fades



Sources: US Census Bureau, Monthly Wholesale Trade Survey

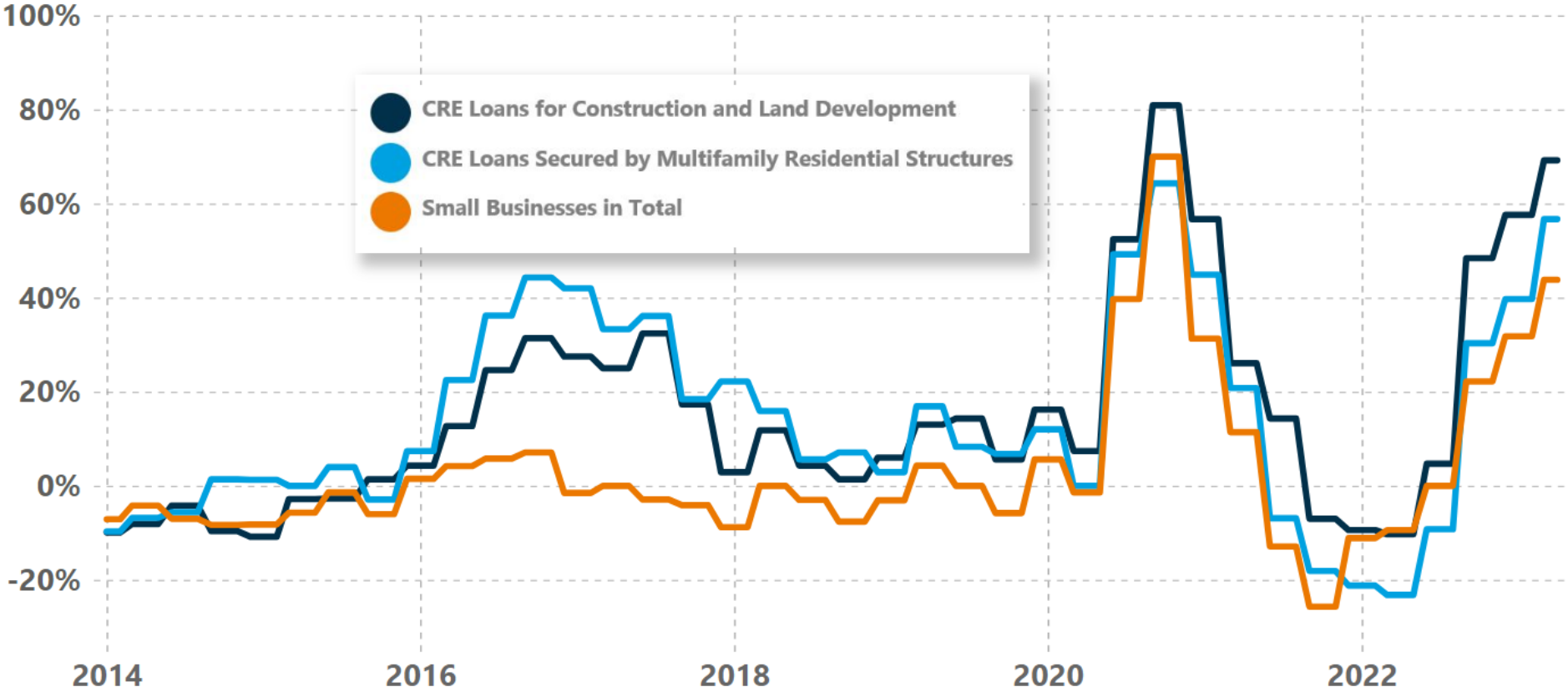
1. Labor will remain the greater risk to your operational cost structure.
2. Material costs in many categories have plateaued and are now declining.
3. Your pre- and post-COVID-19 supply chains need to be reconciled in 2023.
4. Expect very cheap international shipping to bring down imported material costs.



Finance & The Construction Firm

Banks Have Quickly Tightened Loan Standards on Developers Since mid-2022

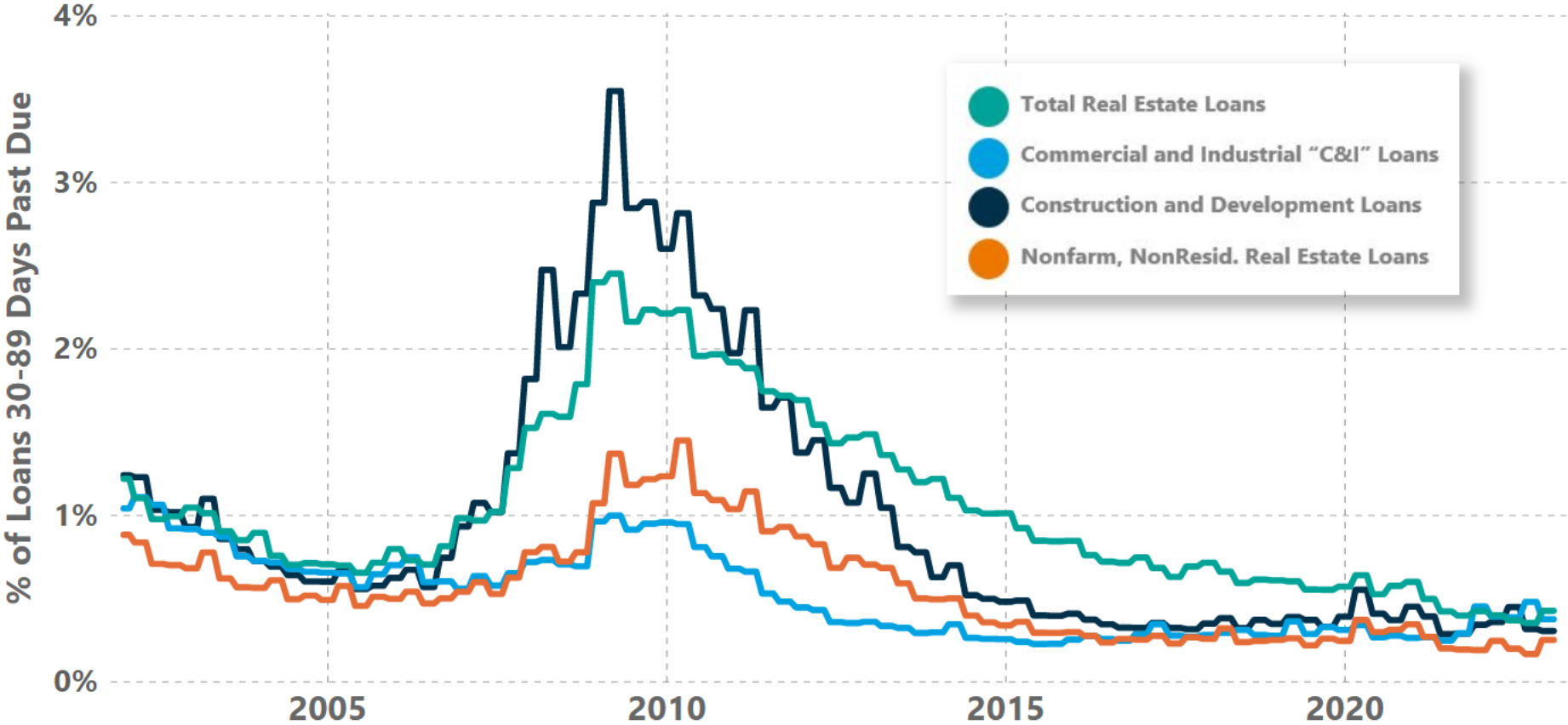
Figures are net percentage of U.S. banks reporting tightening standards by loan type)



Source: Senior Loan Officer Opinion Survey, Federal Reserve

The Performance of R.E. & Development Loans Have Improved Against C&I Loans

Rising C&I loan risk real make real estate and development loans more attractive for first time since 2006



Source: Federal Deposit Insurance Corp., Quarterly Banking Profile Report

1. The current banking crisis puts small banks at substantially greater risk of hardship, which trickles down to their customers.
2. Regional banks may increasingly be able to support only their best borrowers, aka risks.
 - Watch your receivables
 - Have a healthy backlog of work
3. In a worst-case scenario, be prepared to optimize for resilience and endurance.



Questions & Answers

Advancing Preconstruction

May 25–26 | Phoenix, AZ

Booth #137

AIA'23

June 8–9 | San Francisco, CA

Booth #951

SMACNA

October 15–18 | Phoenix, AZ

Booth #406

PHCC

October 25–27 | Cleveland, OH

The Buildings Show

Nov. 29–Dec. 1 | Toronto, ON



Thank You