DUCKER CARLISLE

US Construction Industry Analysis

Mid-Year Analysis & Outlook for 2023-2027

Residential Slump, Infrastructure Growth, Nonresidential Headwinds

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Building & Construction Team

With over 6 decades of research, consulting and M&A advisory services, our teams offer the greatest depth, rigor and value by translating data into action.

Our accomplished building and construction team has the trust and confidence of business executives and deal-makers around the world.

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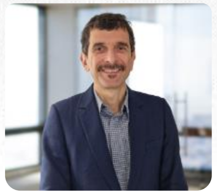

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Dry Infrastructure (road, utility, telecom)	Wet Infrastructure (water, wastewater, stormwater)	Off-site Construction

Our clients include building product manufacturers and material suppliers, leading one step and two step distribution businesses, associations and industry groups representing the building and construction sector, and private equity firms and investment banks. With over 60 years of experience, our consultants have experience in nearly every construction product market and segment of the value chain.

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Integrated services and a client centric approach to inform, optimize, plan, execute and acquire

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Successful M&A support outcomes to operational improvements that save millions of dollars, our teams deliver meaningful results

Mid-Year Analysis & Outlook for 2023-2027

Construction market in transition from demand decline, macro economic pressures and inflationary environment, back towards longer term growth trends

Downward pressure on construction activity from interest rate hikes, financing difficulty, lower occupancy rates, has hit the housing market hard while **nonresidential construction was buffered by short-term boost from prior year contract awards** underway and manufacturing sector boom

Manufacturers and channel members have been working through **excess inventory levels while prior pricing increases sustain margins**, but adjusting to current deflationary pressures while continuing to manage wage, transportation and cost demands

While homeowner improvement spending trends down and will continue to be challenged over the next year**, residential new construction is showing signs of recovery**; there remains significant unmet housing demand with the gap growing between the number of households and available housing stock

Challenges in commercial real estate, nonresidential occupancy rates, interest rates and financing leading to shrinking contract awards and reversal of recent demand strength; nonbuilding continuing to be boosted by **government funding of infrastructure projects** and targeted industrial investment policies

Inflation-supported bump in nonresidential spending coupled with infrastructure growth offset residential weakness

PIP Construction, $ Mill seasonally adjusted	H1-22	H2-22	H1-23	H1-22 to H1-23	H2-22 to H1-23
Residential	$5,616,875	$5,342,900	$5,139,803	-8%	-4%
Nonresidential Building	$3,019,007	$3,318,341	$3,869,004	28%	17%
Nonbuilding	$2,146,966	$2,249,030	$2,440,158	14%	8%
Total PIP Construction	$10,782,848	$10,910,271	$11,448,965	6%	5%

- Slump in residential activity driven by fall in single family new construction; recent signs of stabilization
- Nonresidential building activity modest bump, particularly manufacturing, amplified by carry through of double digit 2022 pricing increase
- Strong growth continues in nonbuilding, infrastructure spending

PPI Construction Goods (June 1986=100)	Dec-21	Jun-22	Dec-22	Jun-23	Jun-22 to Jun-23	Dec-22 to Jun-23
	150	173	162	165	-5%	2%

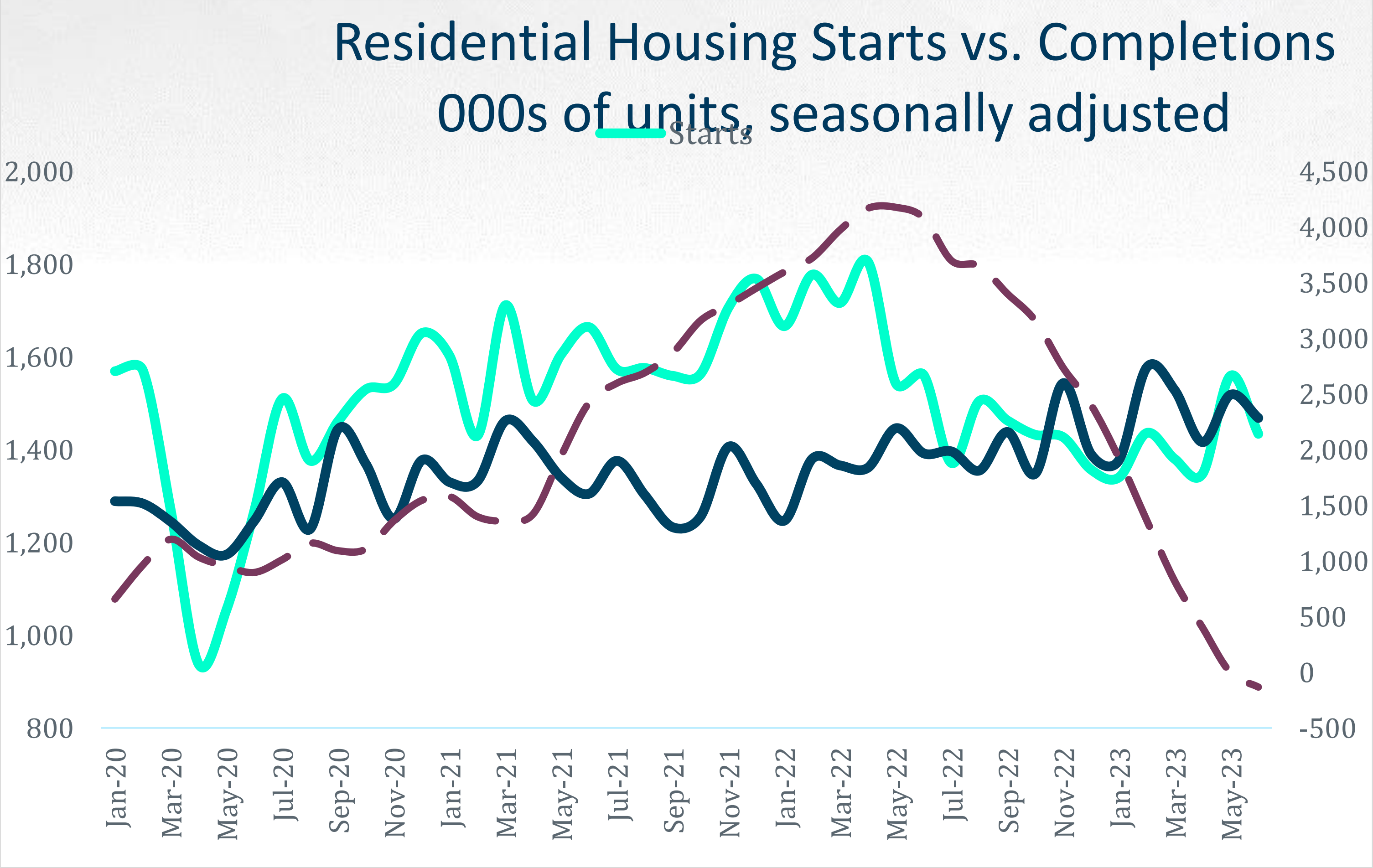
- Material cost input pricing peaked in mid-2022
- Stable over the last 6 months

Interest Rates (June 1986=100)	Jan-22	Jul-22	Dec-22	Aug-23
30-Yr Mortgage Rate	3.45%	5.41%	6.49%	7.09%
Bank Prime Rate	3.25%	5.50%	7.50%	8.50%

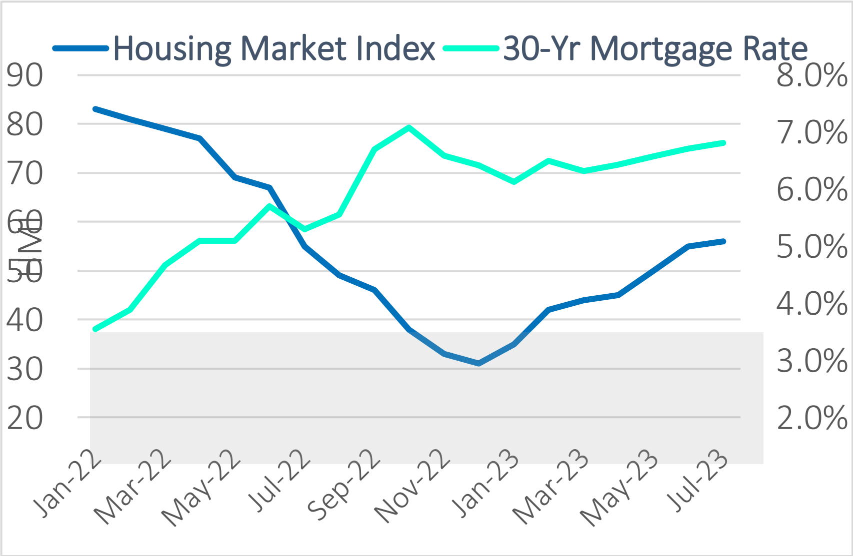
- Multiple interest rates hikes by Fed to current 20 year highs
- Uncertainty around need for further rate increases

Sources: Ducker Analysis, Census, FRED, MBA

Housing starts 12 month decline and erosion of housing backlog following interest rate hikes until recent stabilization amid renewed positive builder sentiment



- New housing completions stable in the first half of the year due to prior backlog, which has now been cleared due to sharp decline in starts since mid 2022
- Homebuilder sentiment* has recovered from a low of 31 in December to 56 in July
- Long term housing gap remains with a deficit of 5 million new housing completions compared to new households formed since 2010



*NAHB/Wells Fargo Housing Market Index - >50 majority positive

Sources: Ducker Analysis, Fannie Mae, NAHB, MBA, NAR, Market Feedback

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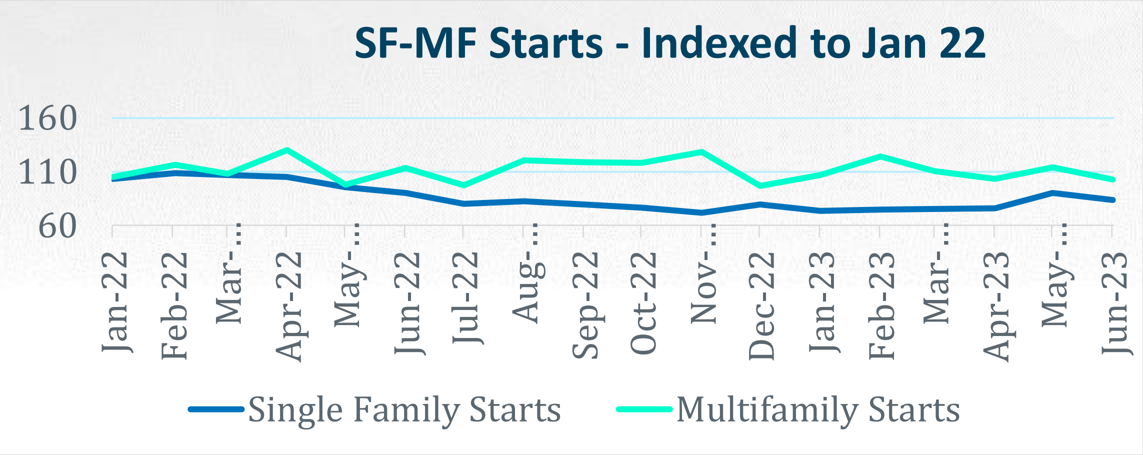
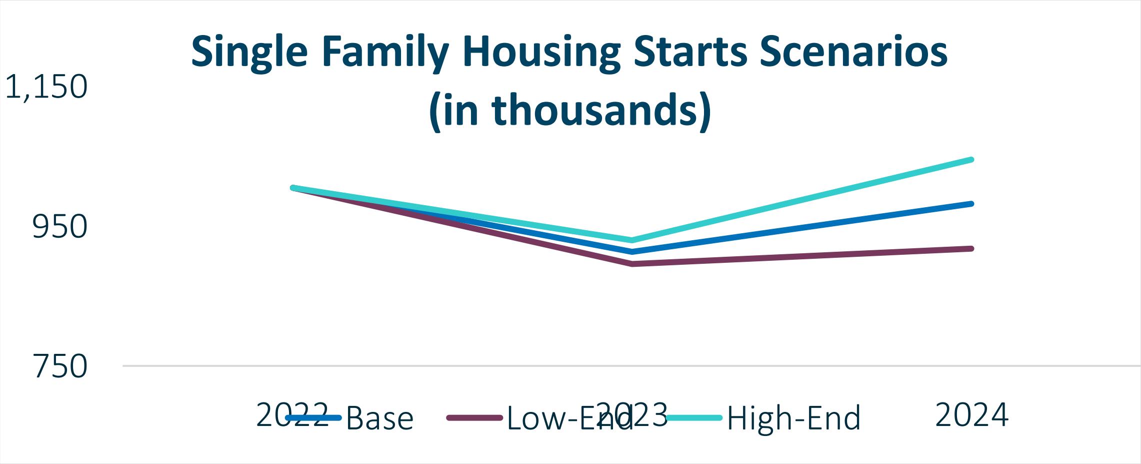
Multifamily starts positive growth maintained offsetting decline in single family starts since peak in late 2021; year-on-year starts flattening with 9% decline in '23 before 8% growth in '24 forecast





Housing Starts ('000)	2022-H1	2022-H2	2023-H1	2022-H1 to 2023-H1	2022-H2 to 2023-H1
Single Family	1,135	876	881	-22%	+1%
Multifamily	543	550	535	-1%	-3%
Total	**1,678**	**1,436**	**1,416**	**-16%**	**-1%**

Single Family Housing Starts ('000)	2022	2023F	2024F	2022F to 2023F	2023F to 2024F
Fannie Mae	1,005	896	890	-11%	-1%
MBA	1,005	920	1,040	-8%	+13%
NAR	1,005	940	1,050	-6%	+12%
NAHB	1,005	896	946	-11%	+6%
Average	**1,005**	**913**	**982**	**-9%**	**+8%**

Multifamily Housing Starts ('000)	2022	2023F	2024F	2022F to 2023F	2023F to 2024F
Fannie Mae	547	512	414	-6%	-19%
MBA	547	509	434	-7%	-15%
NAR	547	530	500	-3%	-6%
NAHB	547	896	409	-9%	-18%
Average	**547**	**512**	**439**	**-6%**	**-14%**

Sources: Ducker Analysis, Fannie Mae, NAHB, MBA, NAR, Market Feedback

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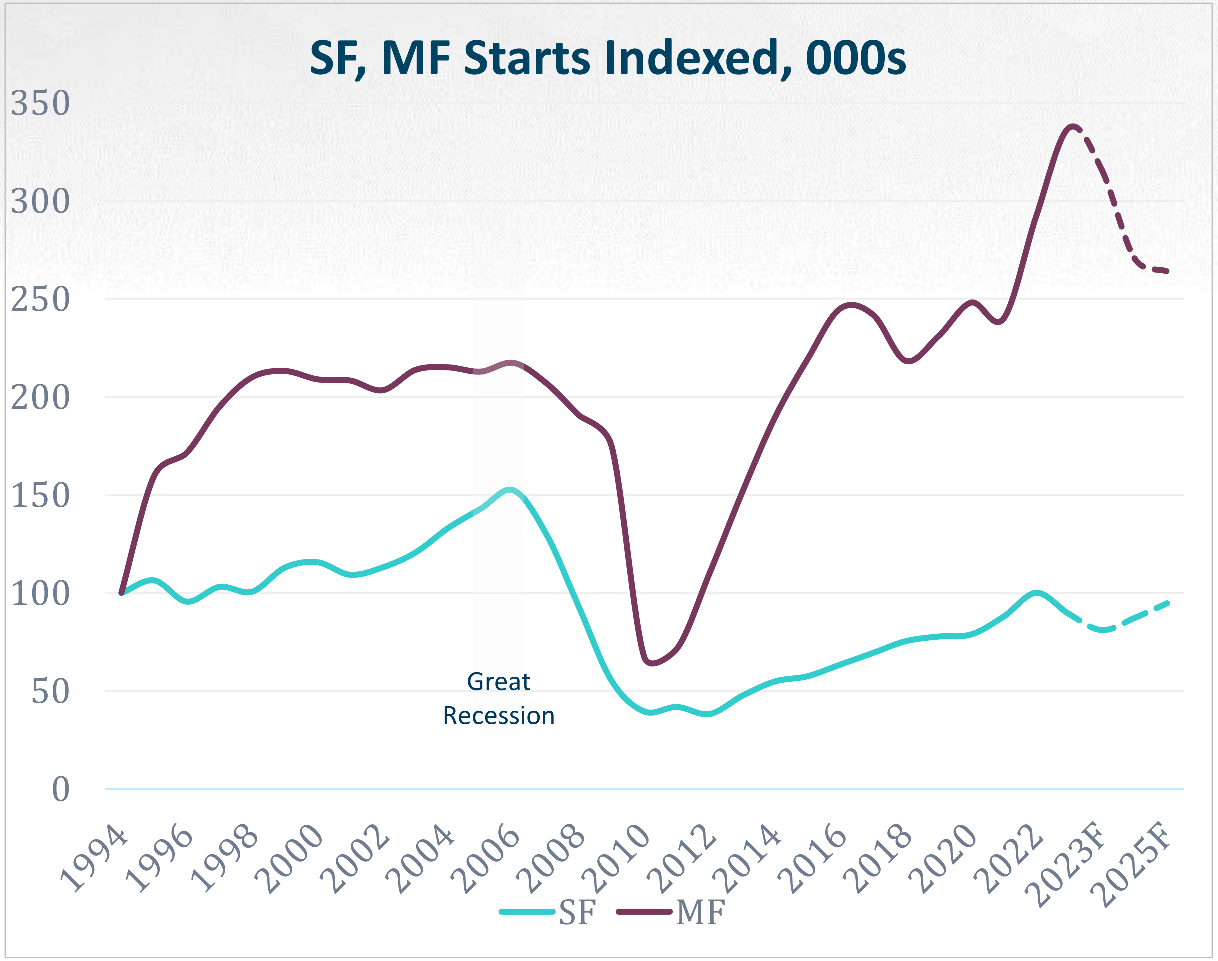
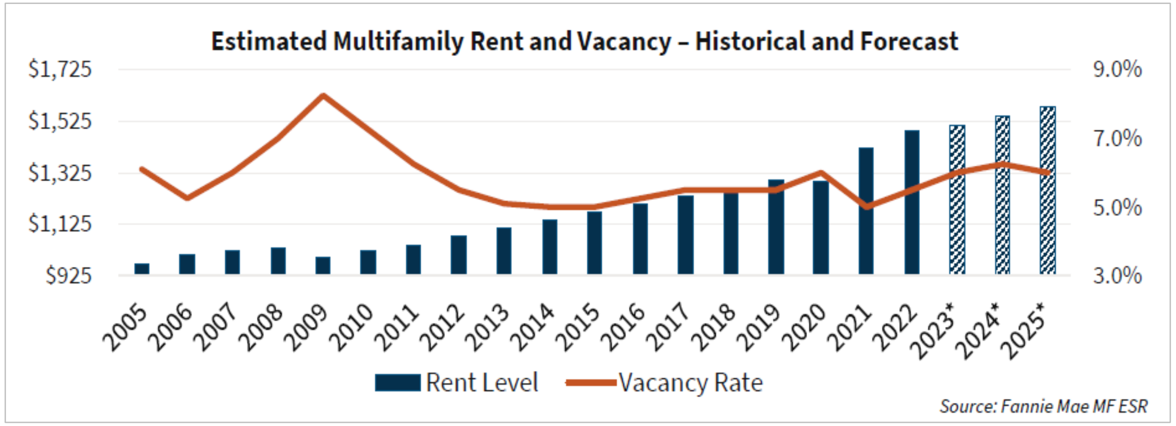
Stable multi-family construction largely offset a 22 percent decline in single family starts in the first half of 2022, with current housing dynamics continuing to favor this sector



- The relative growth of multifamily, outperforming single family, has been a long-term structural trend driven by affordability and lack of entry-level single-family homes
- The multifamily sector is sensitive to economic recession and monetary environment, but low rental vacancy rates and rising rents gave developers confidence to continue building
- Increasing vacancy rates, economic slowdown, and the accumulation of elevated new supply indicates a slowdown but medium term demand stability expected due to home affordability constraints



Sources: Census, NAHB, Fannie Mae, MBA, NAR, Ducker Interviews and Expertise

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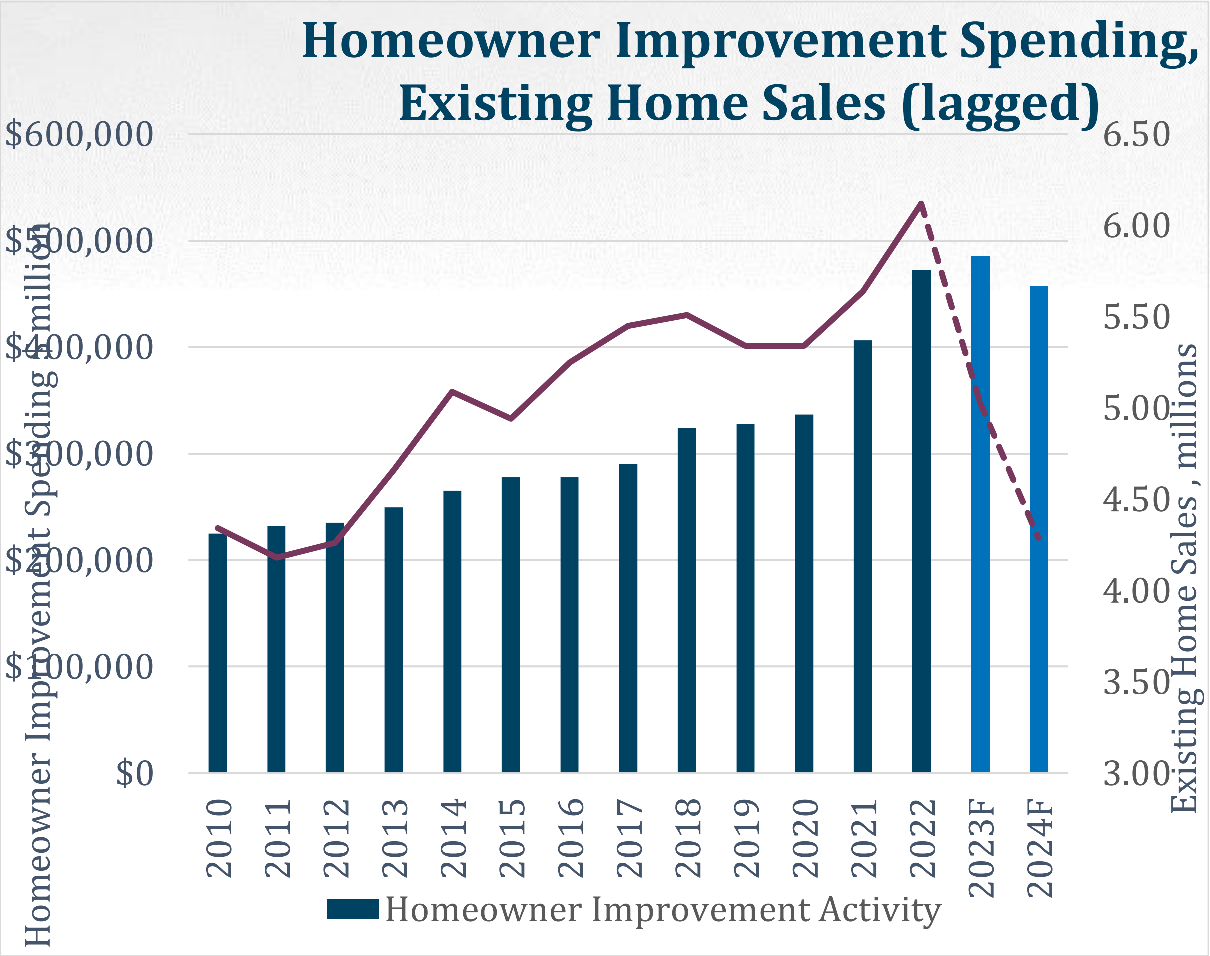
Remodeling expenditures peaked in the second half of 2022 and will continue to decline through 2024 due to lower existing home sales and a return to historical levels after the pandemic bubble



- Inflationary carry-over from 2022 continues to boost homeowner improvement spending on a dollar basis but volume activity on a downward trend with a decline of 6% forecast for 2024
- Downward pricing pressure from elevated inventory levels creating anticipation of declines in material values
- Lower volumes of existing home sales, which traditionally correlate with improvement activity before and after home sales, due to higher interest rates and the large number of homeowners locked in low rates, weaker home prices and home equity levels
- The market is leveling off after several years of above-cycle spending during the Covid pandemic, and activity returning to more normal levels

Home Improvement Spending, $Billions (LIRA)	Half Year	2022-H1	2022-H2	2023-H1	2022-H1 to 2023-H1	2022-H2 to 2023-H1
		$227.4	$243.5	$242.2	+7%	-1%
		2023-H1	2023-H2F	2024-H1F	2023-H1 to 2024-H1F	2023-H2F to 2024-H1F
		543	550	535	-1%	-3%
	Annual	2022	2023F	2024F	2022 to 2023	2023 to 2024
		$470.9	$484.1	$457.0	+3%	-6%

Sources: LIRA, NAR

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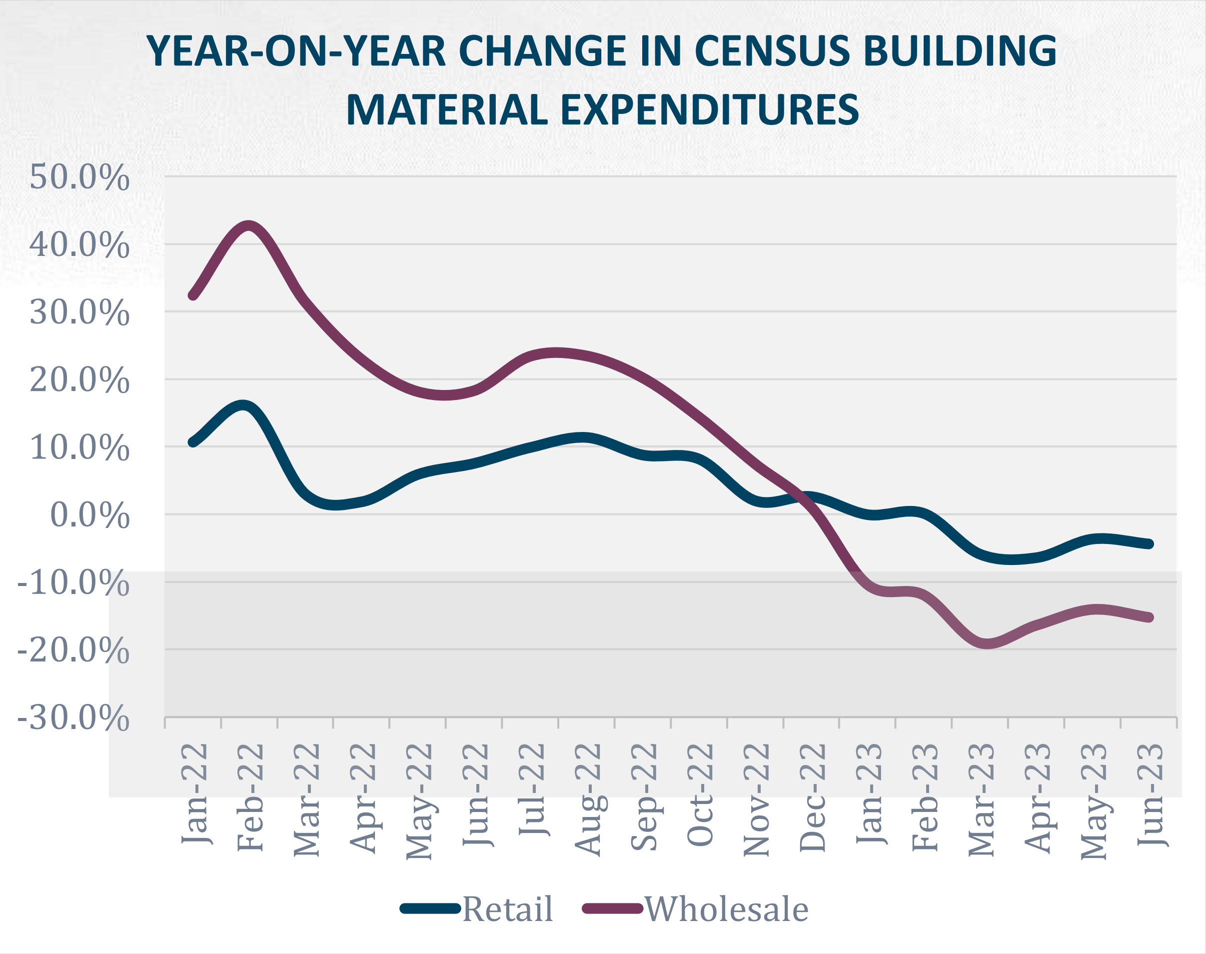
Declines in 2023 retail and particularly wholesale building material expenditures illustrate soft renovation and new construction market demand

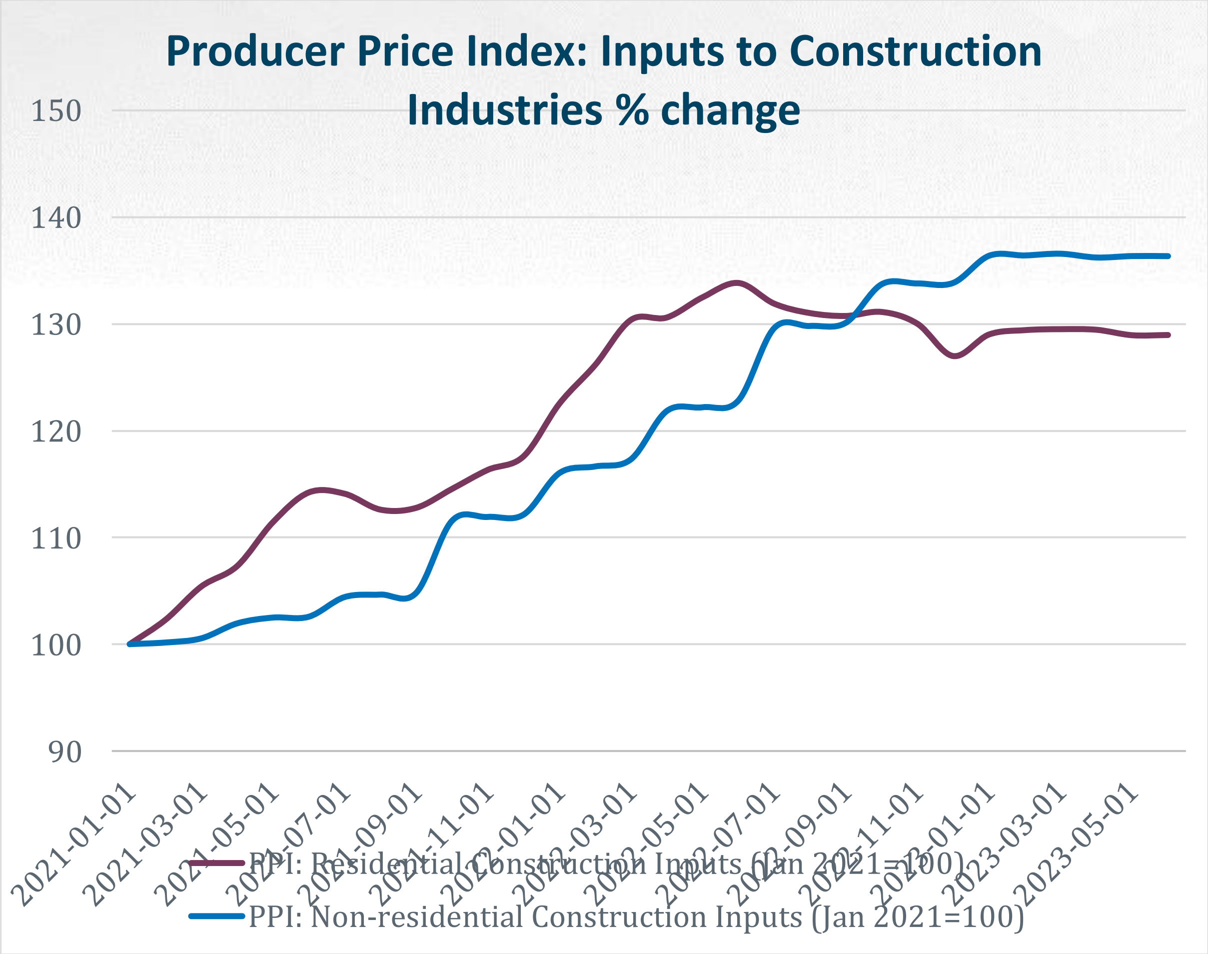


- Double digit decline in wholesale building material expenditures in 2023 following new construction market slump
- Modest low single digit decline in retail building material spending as homeowner activity moderates post pandemic and without inflationary impact
- Declines in expenditures accentuated by lower input pricing particularly in the retail sector driven by inventory build up in 2022 Q4

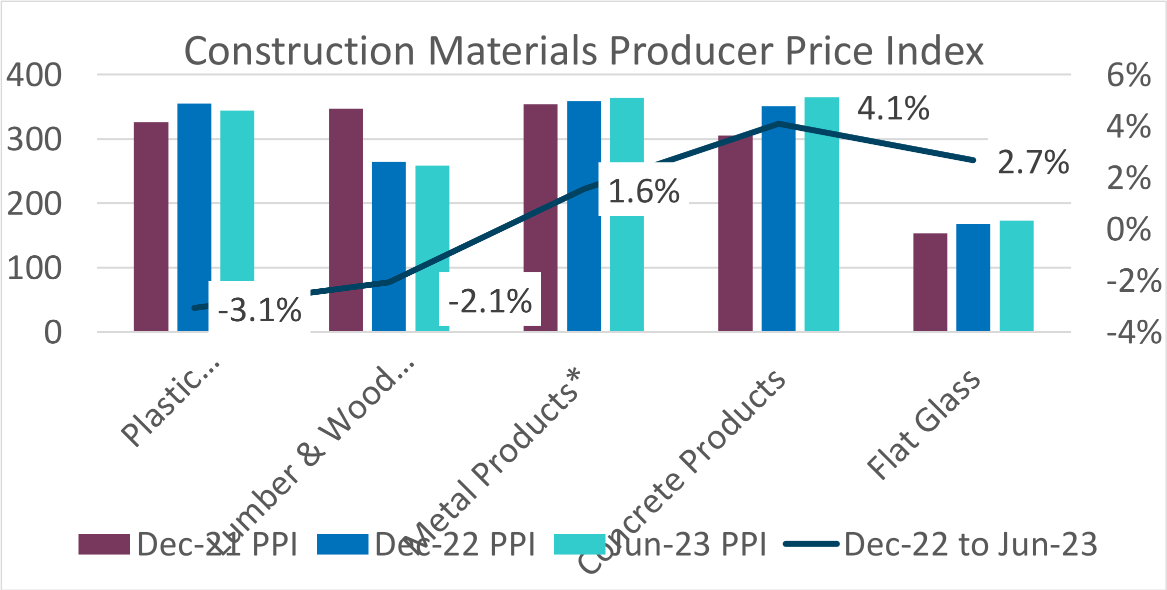
Building Material Expenditures, $B	2022-H1	2022-H2	2023-H1	2022-H1 to 2023-H1	2022-H2 to 2023-H1
Retail	$256.4	$258.4	$251.4	-2%	-3%
Wholesale	$129.8	$123.0	$110.8	-15%	-10%
Total	**$386.2**	**$381.4**	**$362.2**	**-6%**	**-5%**

Sources: Census

Residential input pricing softened since mid-2022 peak while nonresidential index has flattened from beginning of 2023



- Producer Price Index for inputs to both residential and nonresidential construction has flattened since late 2022 – PPI for each sector unchanged in June from January
- Residential PPI has been in decline since May-22 while nonresidential PPI peaked more recently in Jan-23
- Suppliers employing strategies in attempts to hold pricing in face of downward market pressures (Ducker Carlisle pricing practice solutions offering)



*Structural, Architectural, Pre-Engineered Metal Products

Sources: Census

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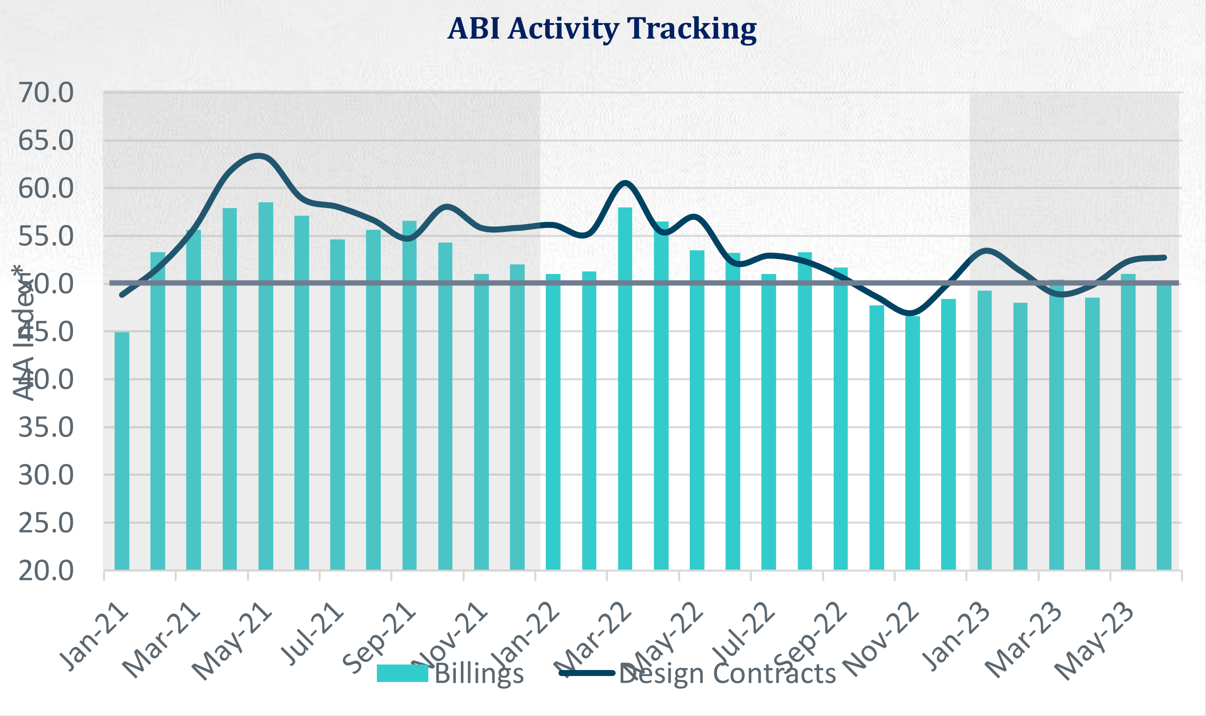
Strong growth in nonresidential building expenditures exceeding expectations but starting to slow down

Construction PIP $ - Nonresidential	2022 Actual	2023 Forecast	2024 Forecast	2025 Forecast	2026 Forecast
Lodging	3.9%	27.9%	6.0%	-0.8%	4.4%
Office	2.2%	10.2%	2.6%	-1.8%	3.8%
Commercial	23.7%	13.3%	-3.4%	-2.4%	2.4%
Health care	9.9%	12.6%	7.7%	3.1%	1.2%
Educational	1.7%	13.8%	8.3%	3.1%	1.9%
Religious	-0.5%	7.3%	2.1%	1.0%	1.8%
Public safety	-6.8%	5.1%	4.3%	7.1%	1.5%
Amusement and recreation	9.6%	11.5%	3.5%	-0.7%	0.1%
Manufacturing	39.2%	61.4%	3.1%	-3.9%	-4.7%
NONRESIDENTIAL BUILDING	13.7%	23.0%	3.2%	-0.8%	0.5%

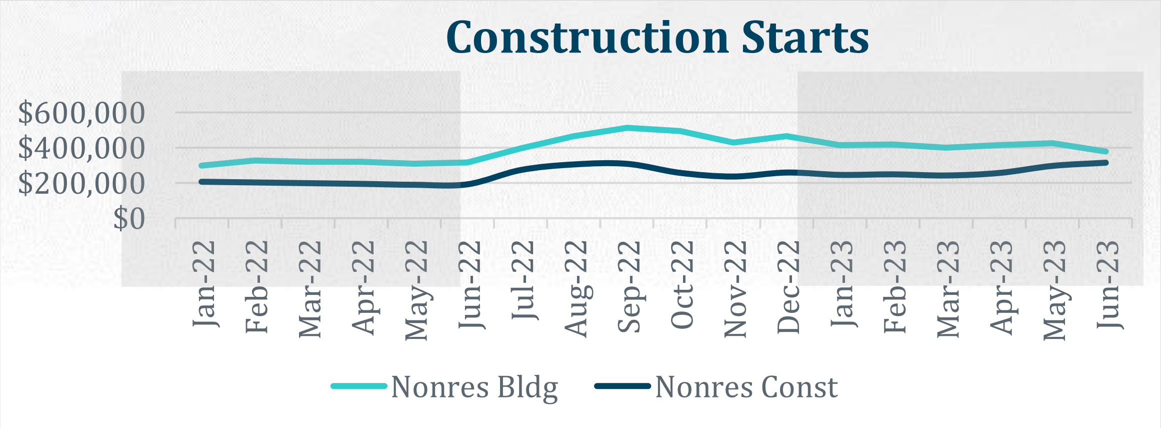
- 2022 growth driven by construction inflation
  - **INFLATIONARY IMPACT ~12 PERCENT, VOLUMES FLAT**
- Strong volume growth in 2023 to exceed 20%, following high level of starts in 2022
- Current manufacturing boom initially spurred by a rapid post-pandemic recovery in demand for durable goods and now fueled by federal subsidies in the Inflation Reduction Act and CHIPS and Science Act

Sources: AIA

AIA indicators and nonresidential building starts have been trending downwards for the past year, while nonbuilding continues steady growth



Sources: Ducker, AIA



Construction Starts, $B	2022-H1	2022-H2	2023-H1	2022-H1 to 2023-H1	2022-H2 to 2023-H1
Nonresidential Building	$317.7	$488.3	$388.7	+22%	-20%
Nonbuilding Construction	$194.0	$278.2	$283.5	+43%	-2%

- Billings and Design Contracts activity has flattened out since November 2022, slightly positive
- Nonresidential building starts up over 20% from prior year but down by a corresponding degree from second half of 2022
- Resumption of growth in nonbuilding starts with over 40% growth year-on-year

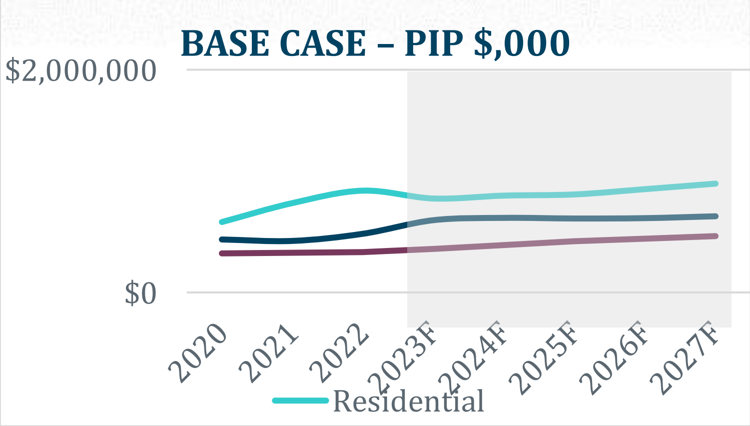
**A score above 50 indicates an increase in billings from the previous month, and a score below 50 indicates a decline*

Sources: Census, NAHB, Dodge

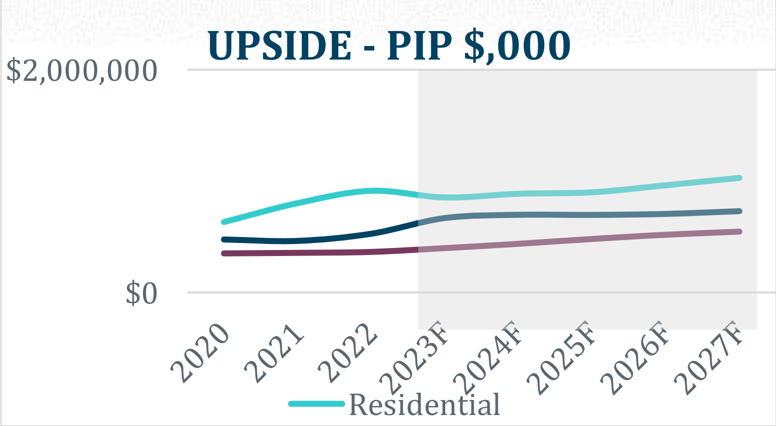
Industry Insights – Forecast Scenarios

All scenarios show an overall increase in $ expenditures over the next 4 years, with nonbuilding construction leading the way with future annual growth between 5% and 8%; nonresidential building spending will moderate after a strong surge in 2023, with annual growth of between 0% and 2% between 2023 and 2027; residential activity will trend in an opposite direction, resuming growth of 3% to 5% annually after a high single figure decline in 2023.

	'22 to '23	2023-2027 CAGR
Residential Building	-8.9%	2.7%
Nonresidential Building	19.5%	0.4%
Nonbuilding Construction	6.8%	4.6%
Total PIP Construction	2.6%	2.3%



	'22 to '23	2023-2027 CAGR
Residential Building	-7.7%	3.7%
Nonresidential Building	23.5%	1.3%
Nonbuilding Construction	8.0%	6.4%
Total PIP Construction	4.5%	3.5%



	'22 to '23	2023-2027 CAGR
Residential Building	-6.5%	4.8%
Nonresidential Building	26.4%	2.2%
Nonbuilding Construction	9.2%	8.1%
Total PIP Construction	6.3%	4.7%

Sources: Census, NAHB, AIA, FRED, CBRE, HUD, NAR, Ducker Interviews and Expertise

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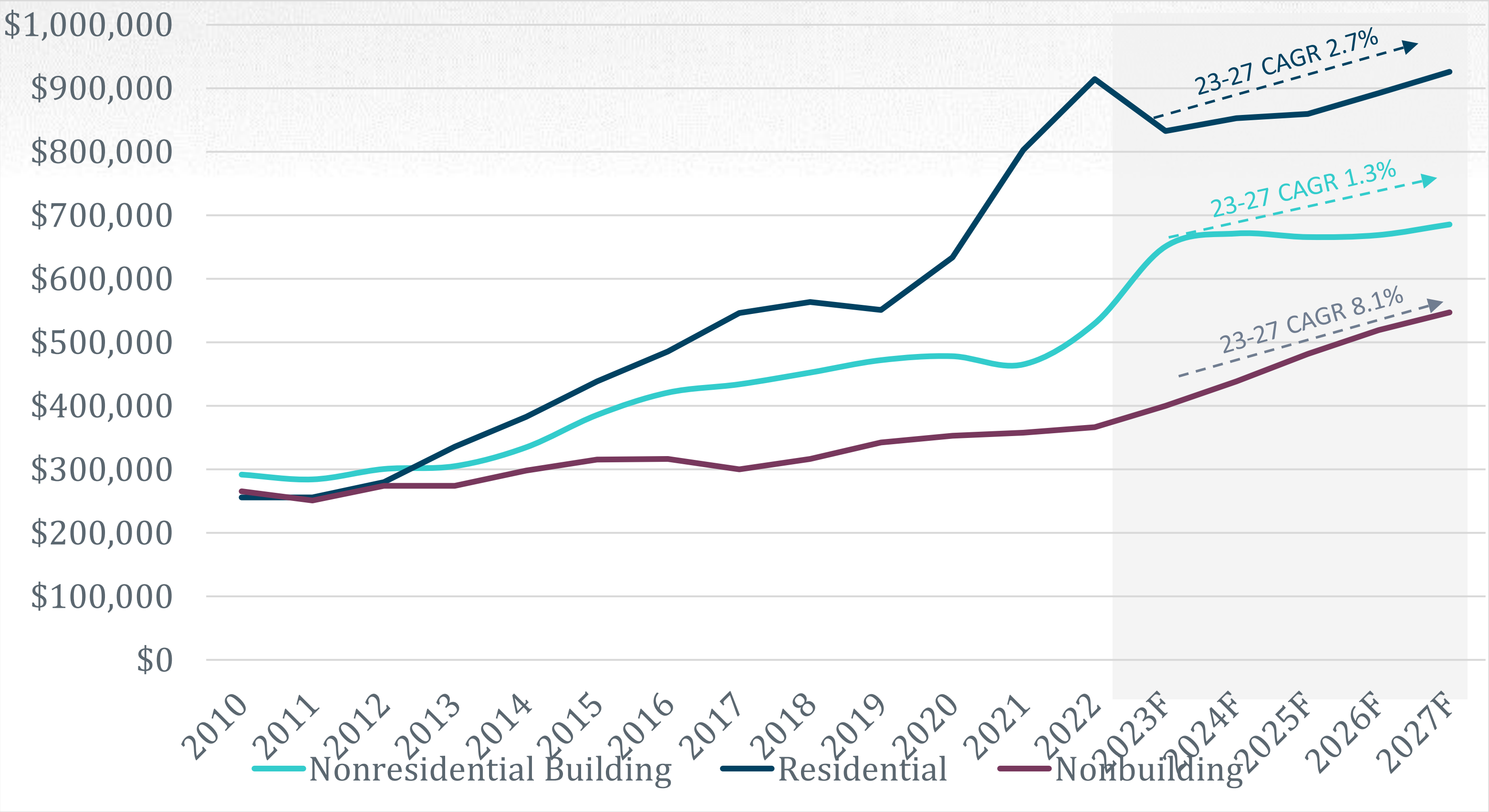
Most Likely Alternative Scenario

CONSTRUCTION ($) PIP FORECAST – MARCH 2023 SCENARIO Downside Case for Residential, Upside for Nonresidential, Base for Nonbuilding



Residential – DOWNSIDE – Continued threat of further interest rate increase as elements of inflation remain sticky, and consumer spending and home improvement dampens due to increased unemployment and recessionary economic conditions.

Nonresidential – BASE - Non-residential construction moderates after blistering start to 2023, with dampening impact of overall economic environment and residential softening.

Nonbuilding – BASE – Government funding continues to sustain strong growth forecast, as infrastructure remains a priority for both sides of the political aisle, and will be insulated from overall economic shifts.

Sources: Census, NAHB, AIA, FRED, CBRE, HUD, NAR, Ducker Interviews and Expertise

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