

The PCA logo features the letters 'PCA' in a bold, white, sans-serif font. A white swoosh underline starts under the 'A' and extends to the right, ending in a registered trademark symbol (®). The background is a grayscale photograph of a large concrete bridge structure with arches, set against a cloudy sky and a rocky landscape with a river in the distance.

**PCA**®

*Since 1916*

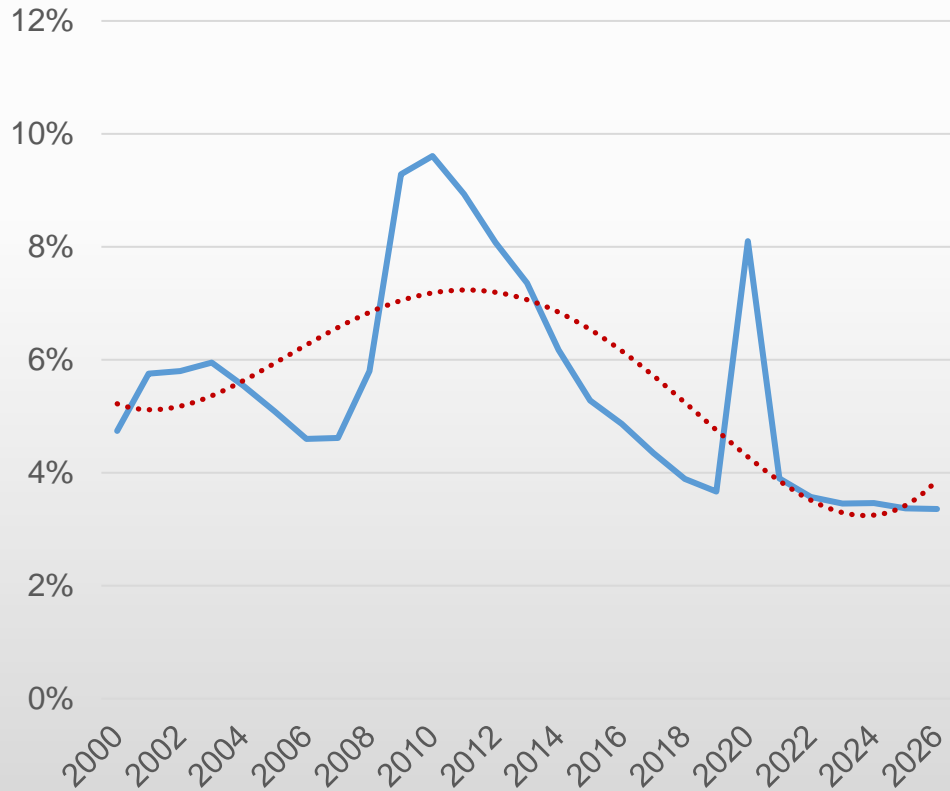
America's Cement Manufacturers™

## Cement Outlook

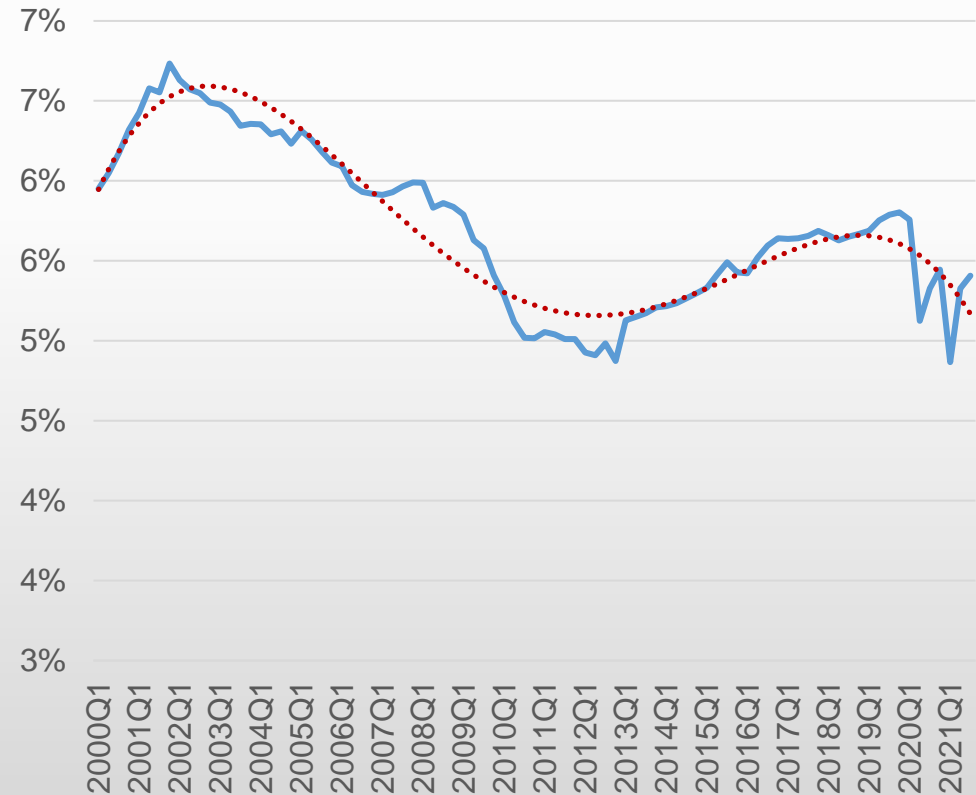
Ed Sullivan, SVP & Chief Economist

# Context: The Economy is Strong

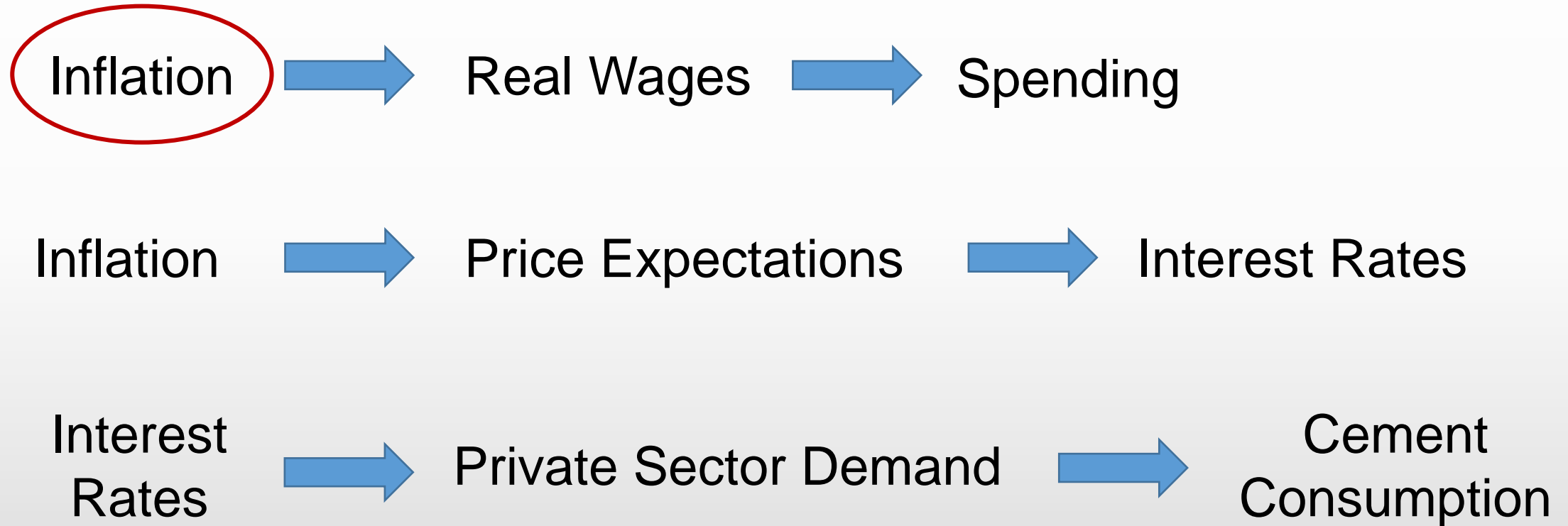
**Labor Markets Are Strong**  
% Unemployed



**Household Debt Service Ratio**  
Debt as % of Disposable Income



# Key Focus for Economy, Construction, Cement Outlook



# US Economic Outlook: External Forecast Considerations

## Russia-Ukraine War

### Key Assumptions:

Will the War stay Within Ukraine Borders?  
How long will Supply disruptions persist?  
Is a Nuclear Option off the Table?

- Scenario Analysis

### Potential Impacts:

- Inflation
- Consumer Sentiment
- Fed Policy.

## Covid

### Key Assumptions:

Will disease Worsen or Improve?  
Will a New Variant Emerge?

- Institute of Health Metrics & Evaluation (IHME) Projections.

### Potential Impacts:

- Consumer Sentiment & spending.
- Labor Force Participation
- Supply-Chain improvement.

# Covid Impact

# Covid Global Decline: Impacts

## Demand Improvement

### Key Judgements:

- Consumer in a strong position
- Return to “normal”
- Pent-Up Demand Release
- Accelerated Consumer Spending in 2<sup>nd</sup> Half of 2022.

### Potential Impacts:

- GDP Strengthens
- Adds to Employment Requirements
- Adds Mildly to Inflation.

## Supply-Side Improvement (Inflation)

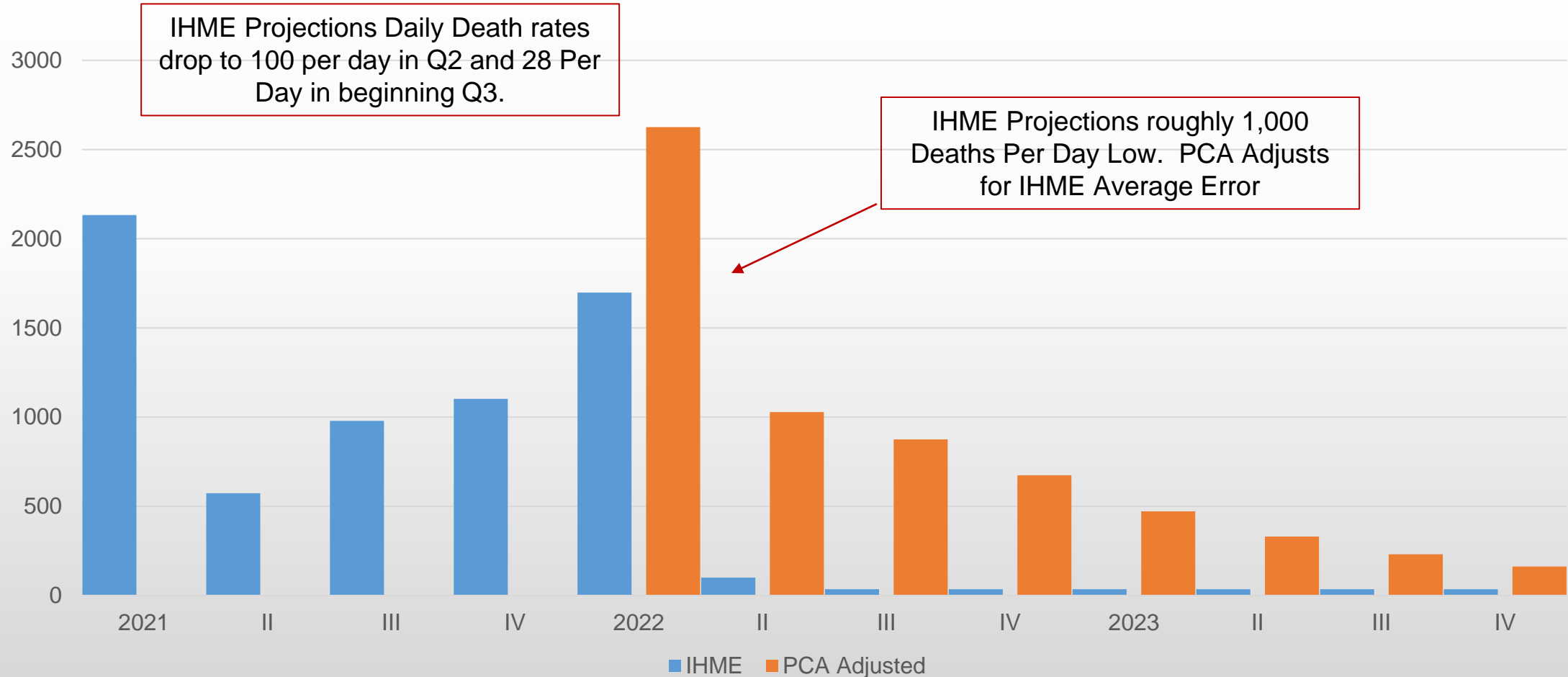
### Key Judgements:

- Labor Participation Rate Improves
- Logistics Improve (US & Globally)
- Inventory-Sales Ratio Improves

### Potential Impacts:

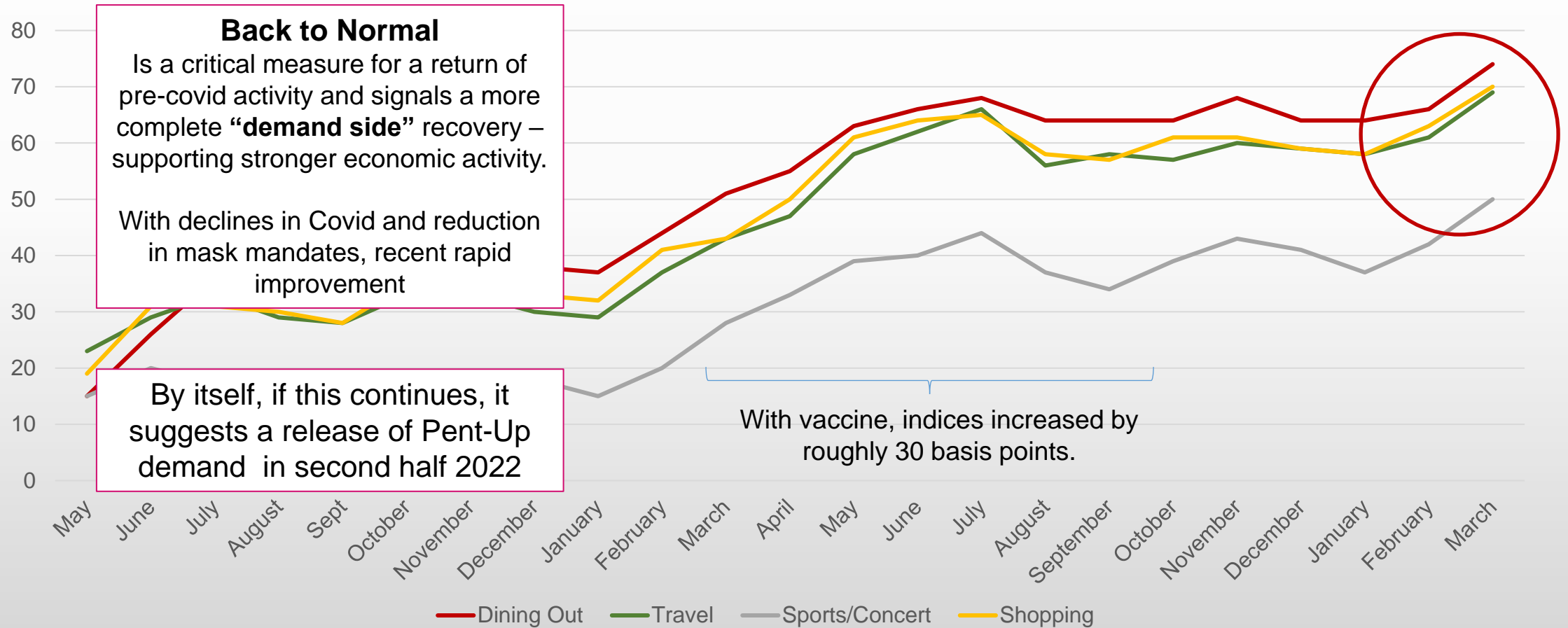
- Supply-Side Inflation Eases
- Relieves Some Pressure on Fed to Raise Rates.

# IHME & PCA Adjusted Covid Projections



# Consumer Comfort

Morning Consult, % All Adults

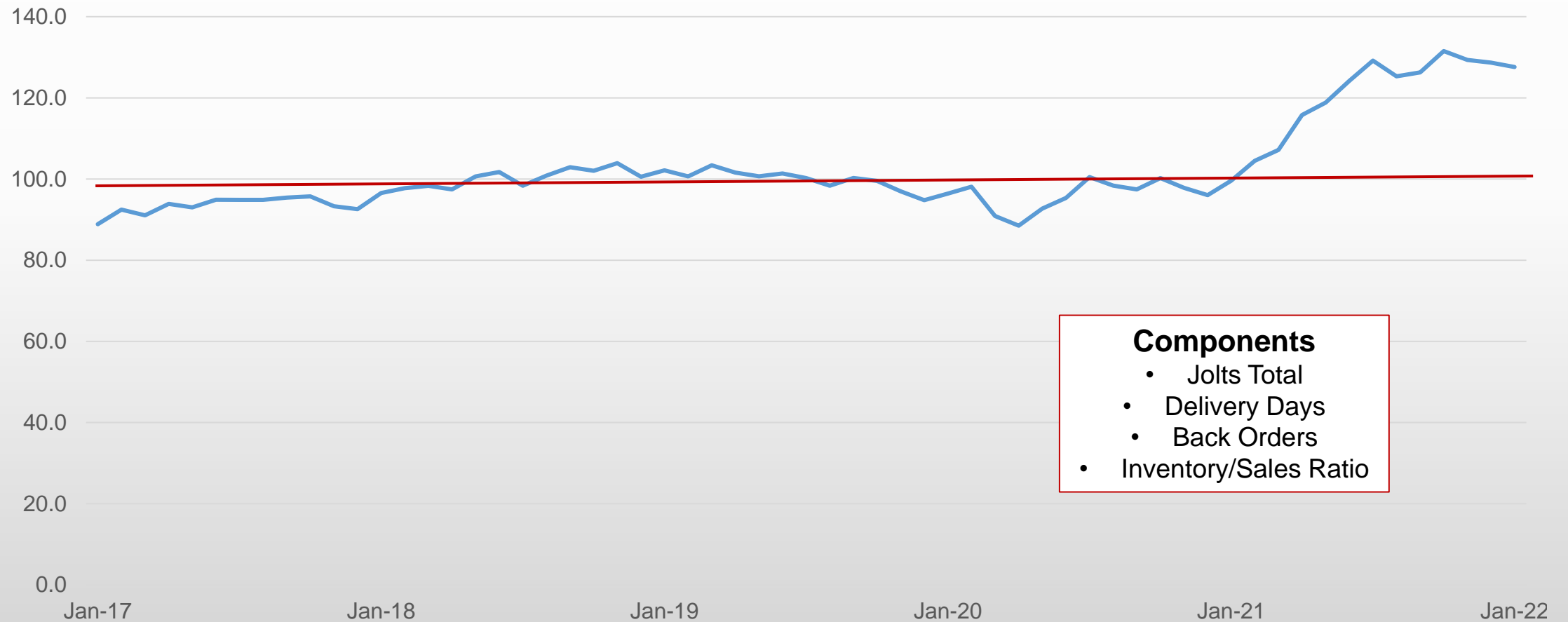






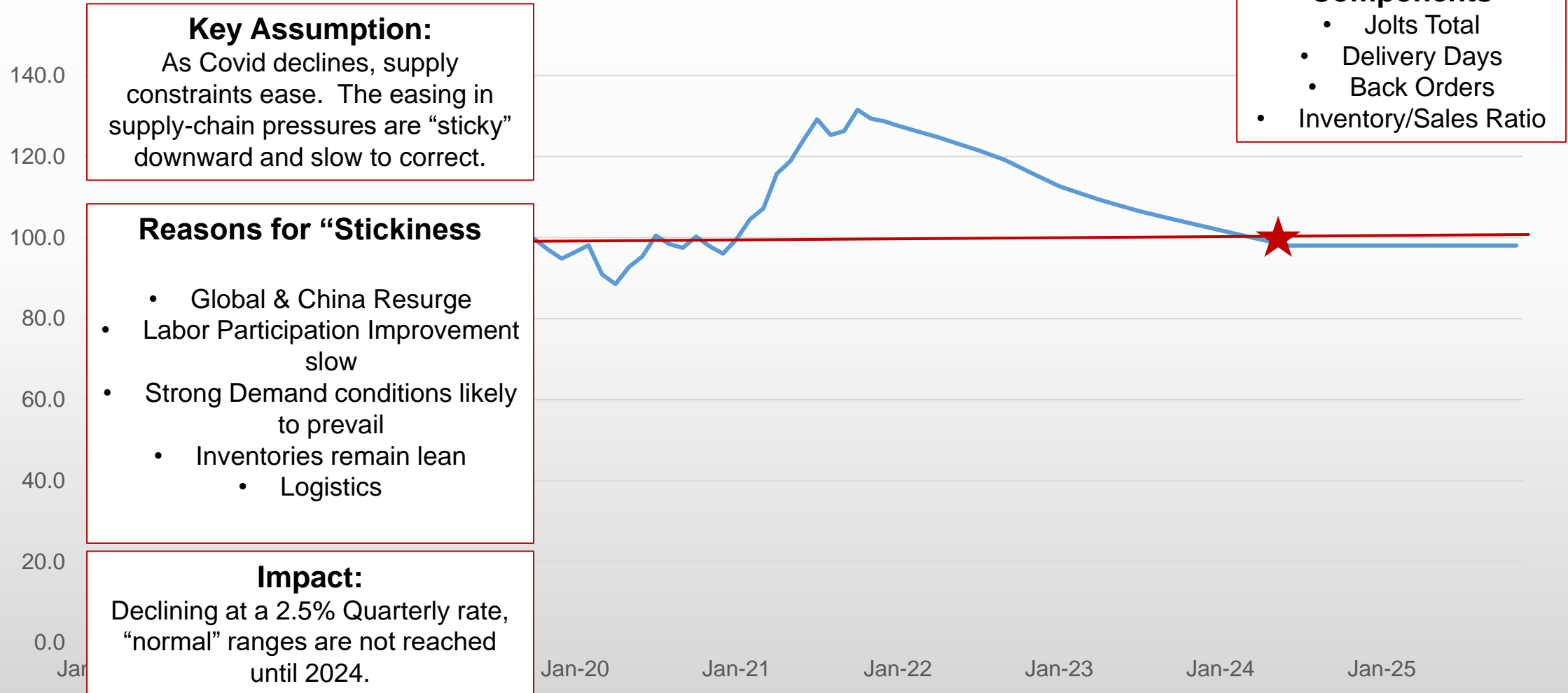
# PCA Supply Chain Index

2019=100



# PCA Supply Chain Index

2019=100



**Key Assumption:**  
As Covid declines, supply constraints ease. The easing in supply-chain pressures are “sticky” downward and slow to correct.

- Reasons for “Stickiness”**
- Global & China Resurge
  - Labor Participation Improvement slow
  - Strong Demand conditions likely to prevail
    - Inventories remain lean
    - Logistics

**Impact:**  
Declining at a 2.5% Quarterly rate, “normal” ranges are not reached until 2024.

- Components**
- Jolts Total
  - Delivery Days
  - Back Orders
  - Inventory/Sales Ratio

# Ukraine Impact

# Russia/Ukraine Contribution to World Production

## Commodity/Item:

- Oil
- Titanium
- Wheat
- Natural Gas
- Palladium
- Helium
- Neon

## Share, World Production:

- 12%
- 13%
- 14%
- 17%
- 30%
- 30%
- 70%

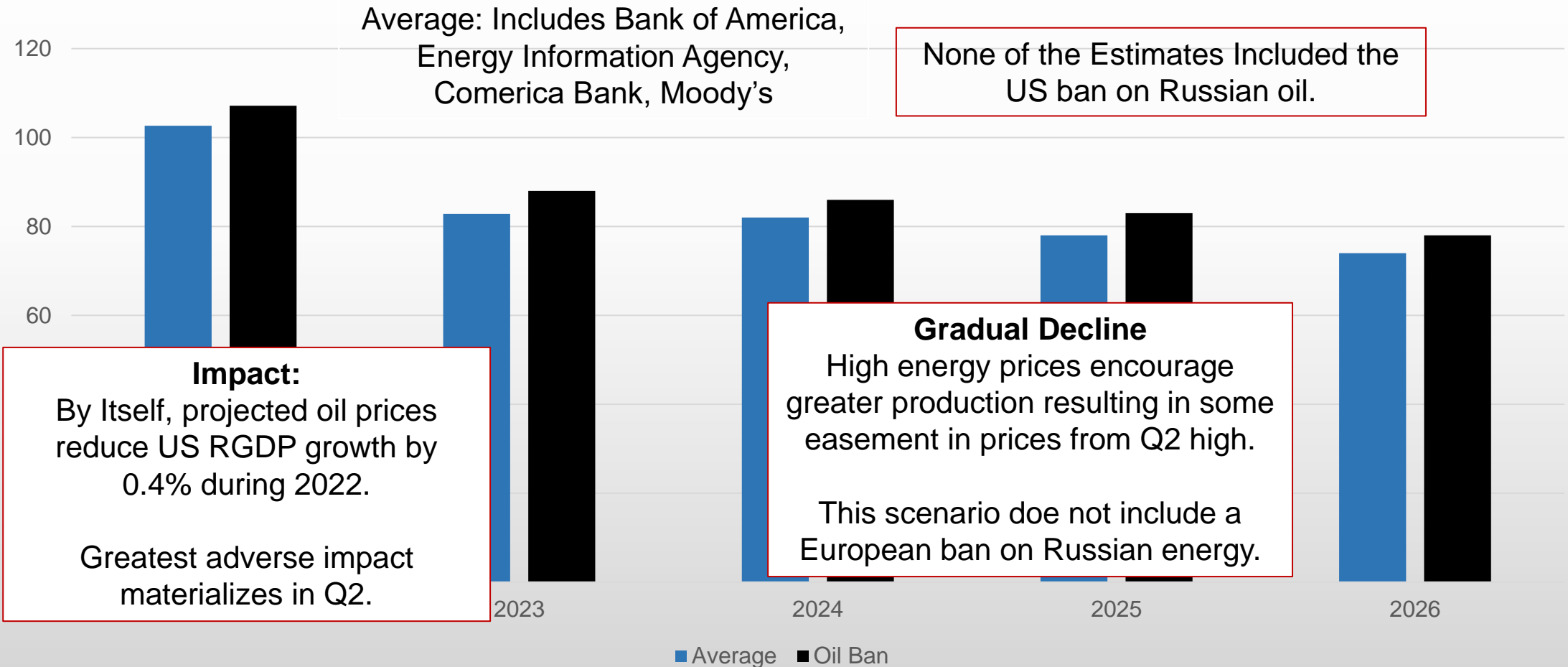
## Potential Impacts:

- Higher Global Oil Prices
- ---
- Impacts LDCs
- European Focused Impacts
- Catalytic Converters
- ----
- Required in Chip production

Russia contributes to the global supply chain. As trade in these materials are depressed, improvement in supply-chain is impaired.

# Oil Price Assumptions

## WTI Dollars Per Barrel



# Ukraine Assumptions: Baseline

## Key Assumptions:

- Russia occupies Ukraine
- Ukraine resistance continues
- Oil WTI peaks at \$115 per barrel.
- Revoke Russia MFN Status
- Aggression constrained to Ukraine
- No cyberattacks
- No nuclear

## Potential Impacts:

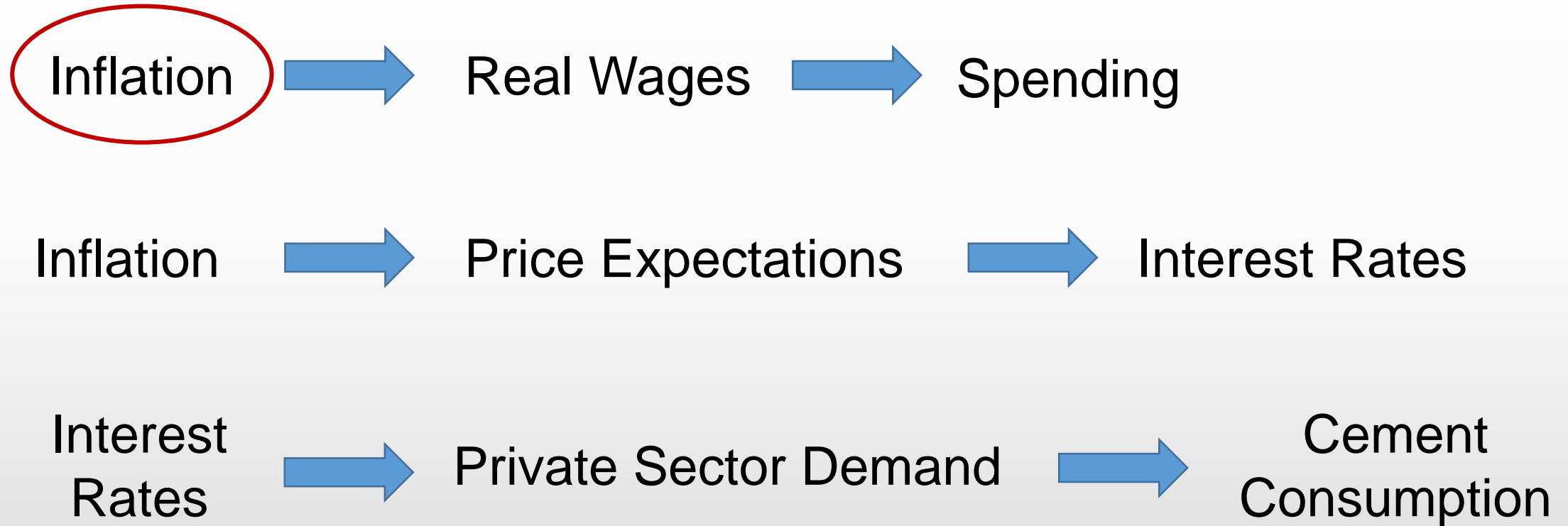
- Key commodities rise significantly
- Additional disruption to supply chain
- Inflation higher
- Real wage declines
- Slower global growth
- Sustained increases in interest rates
- Cement consumption growth slows

**Growth Slowdown. No Recession**

# Inflation



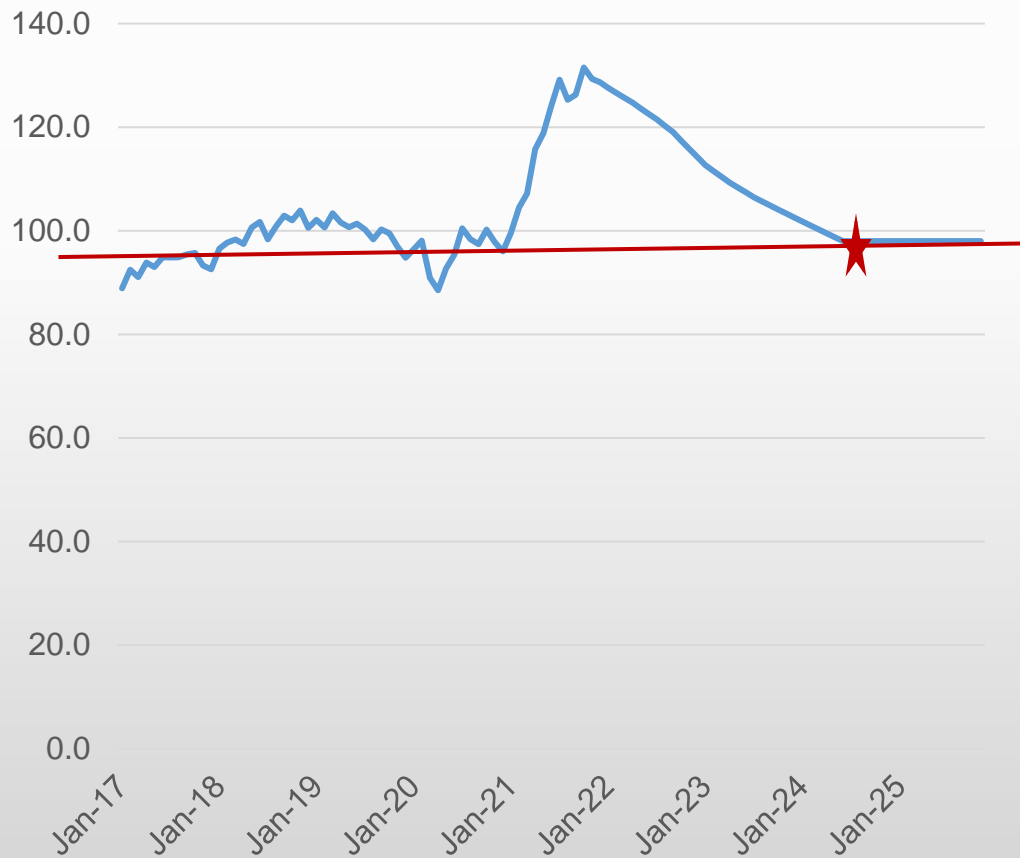
# Key Focus for Economy, Construction, Cement Outlook



# Contributors to Inflation Outlook

## PCA Supply Chain Index

2019=100



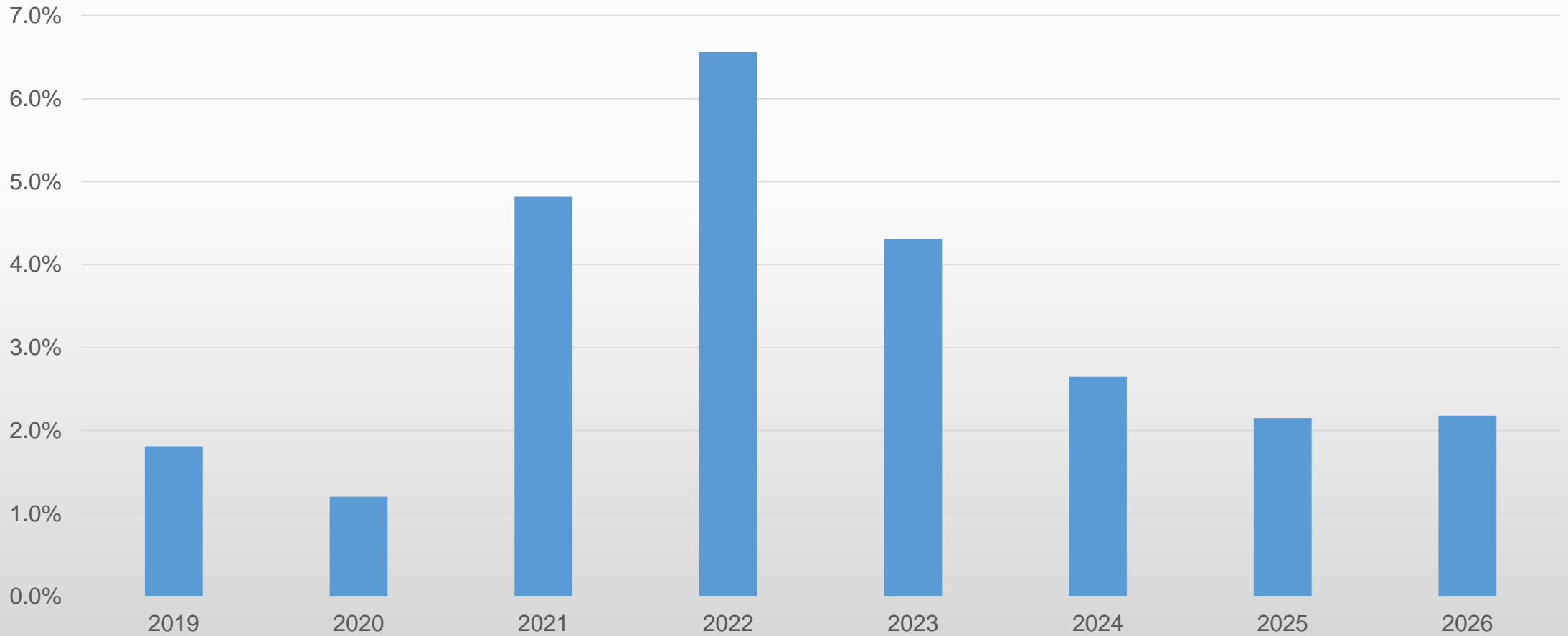
## Oil Prices

West Texas Intermediate, 7 Day Moving Average



# Inflation Outlook

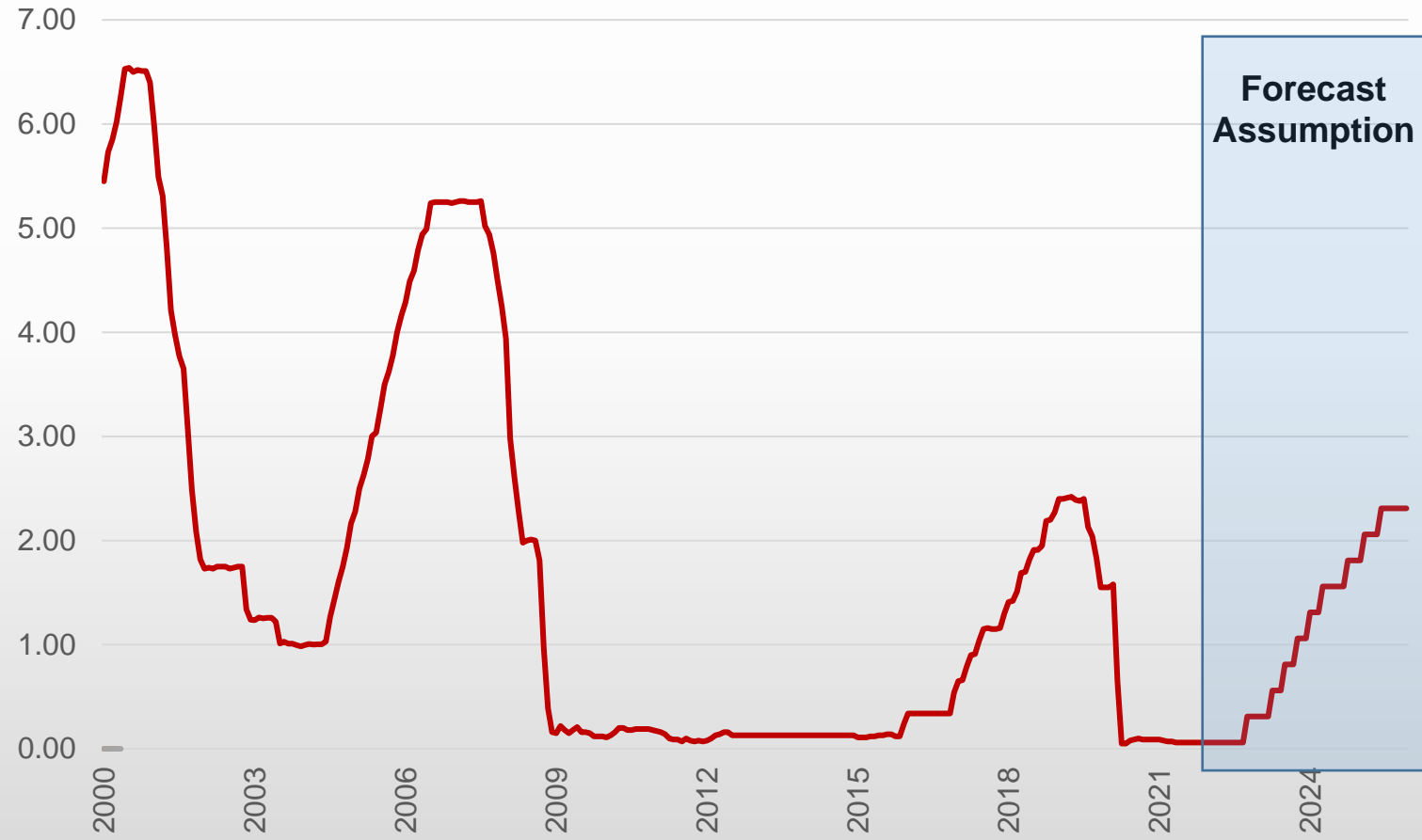
CPIU % Change



# Interest Rates

# Monetary Policy: Update

## Fed Funds Rate



## Interest Rate Drivers

**Tapering:** Has begun and is expected to be complete by mid-year. Further reduction in Fed balance sheet are expected beyond mid-year.

**Federal Funds Rate:** Fed begins rate hikes this month. Rate increases are small. Assume 25 basis point increases.

**Inflationary Expectations:** Have already become noticeable in mortgage rates.

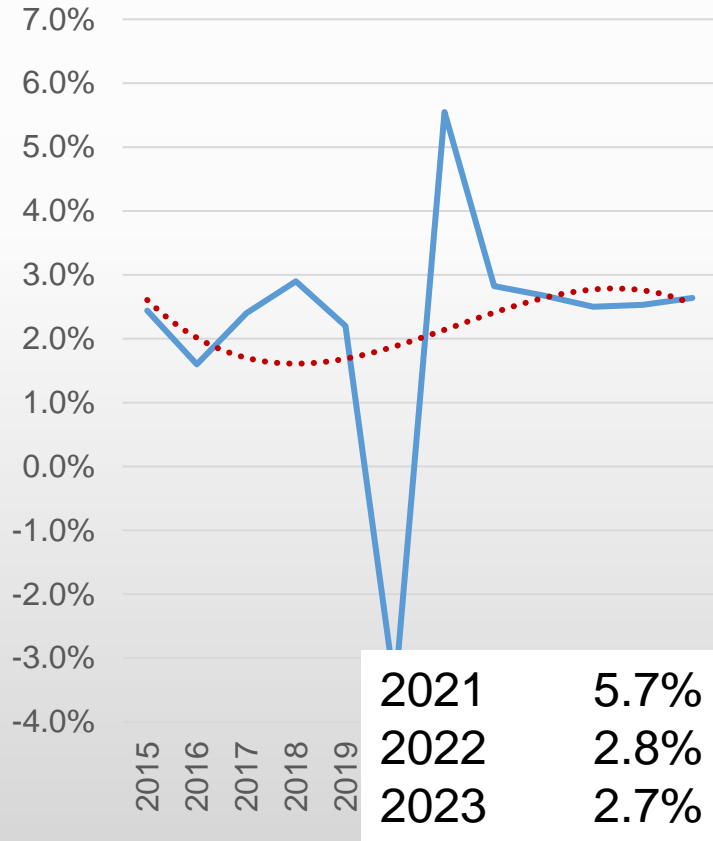
Near term risks for mortgage rates are on the upside.

# Macroeconomic Summary

# Macroeconomic Summary: Baseline

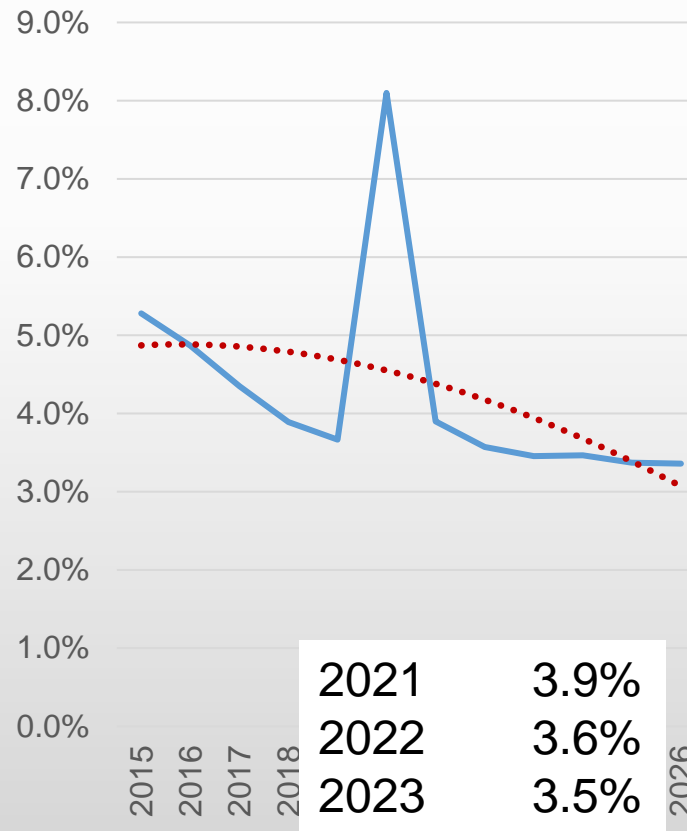
## GDP Growth

Real GDP Annual Growth



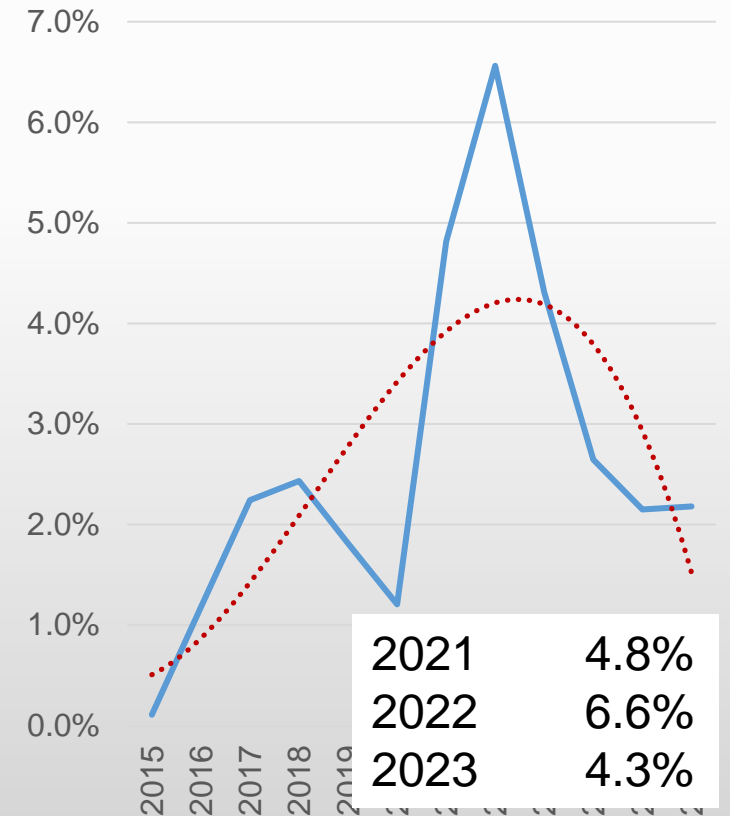
## Unemployment Rate

Percent Unemployed



## Inflation Rate

CPIU, Annual Percent Change

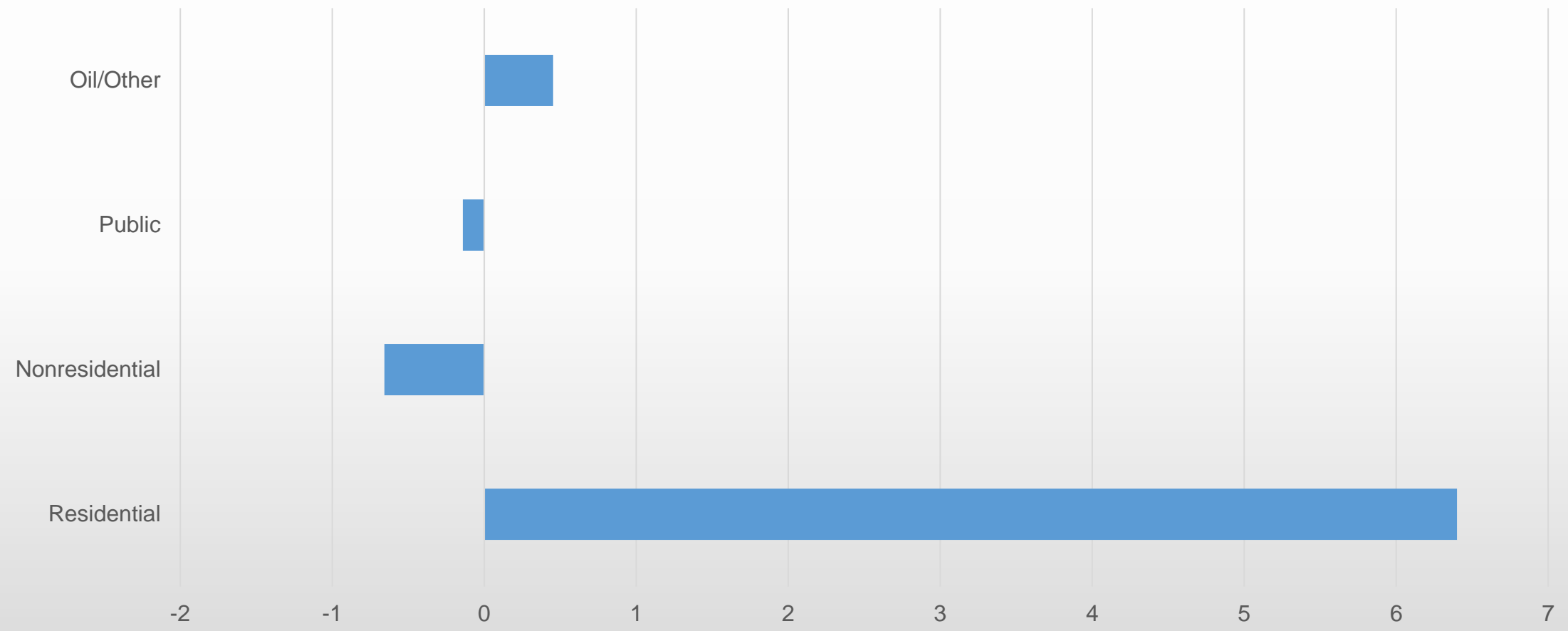


# Growth by Market Segment



# Composition of Growth

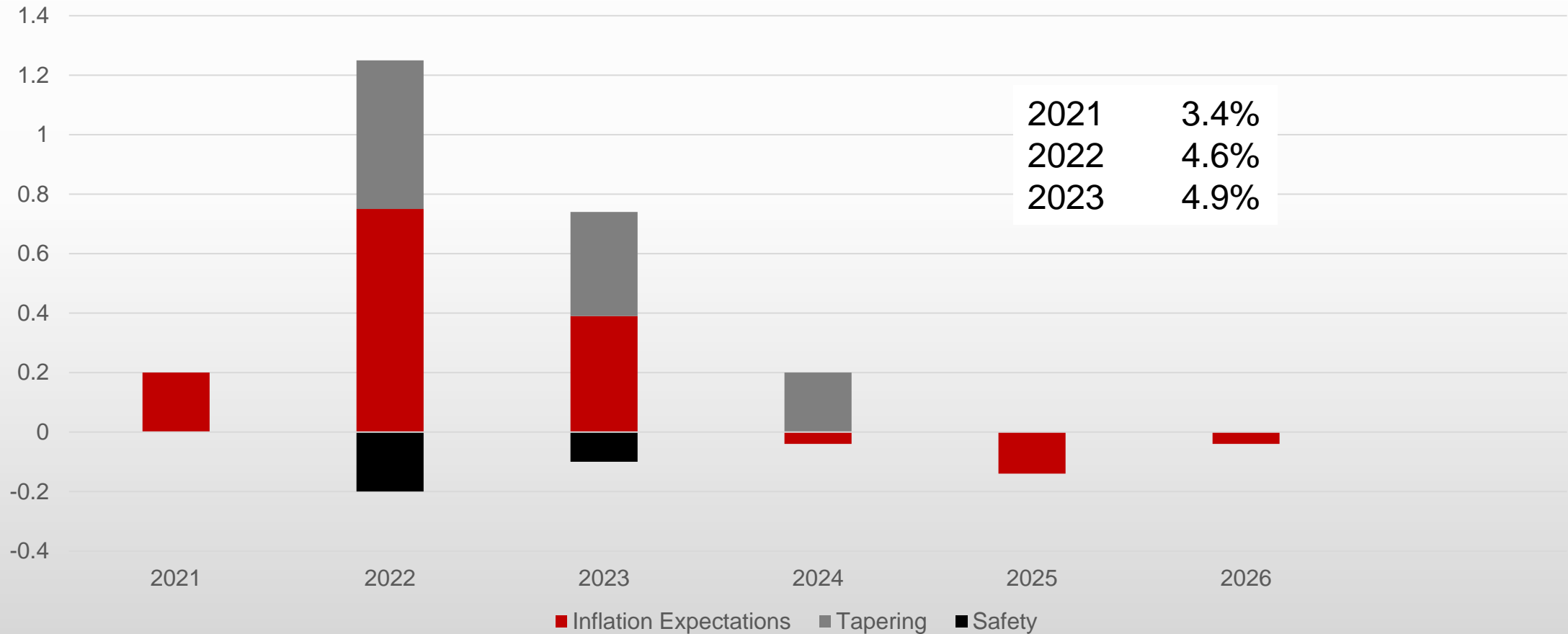
## 2020-2021



# Residential

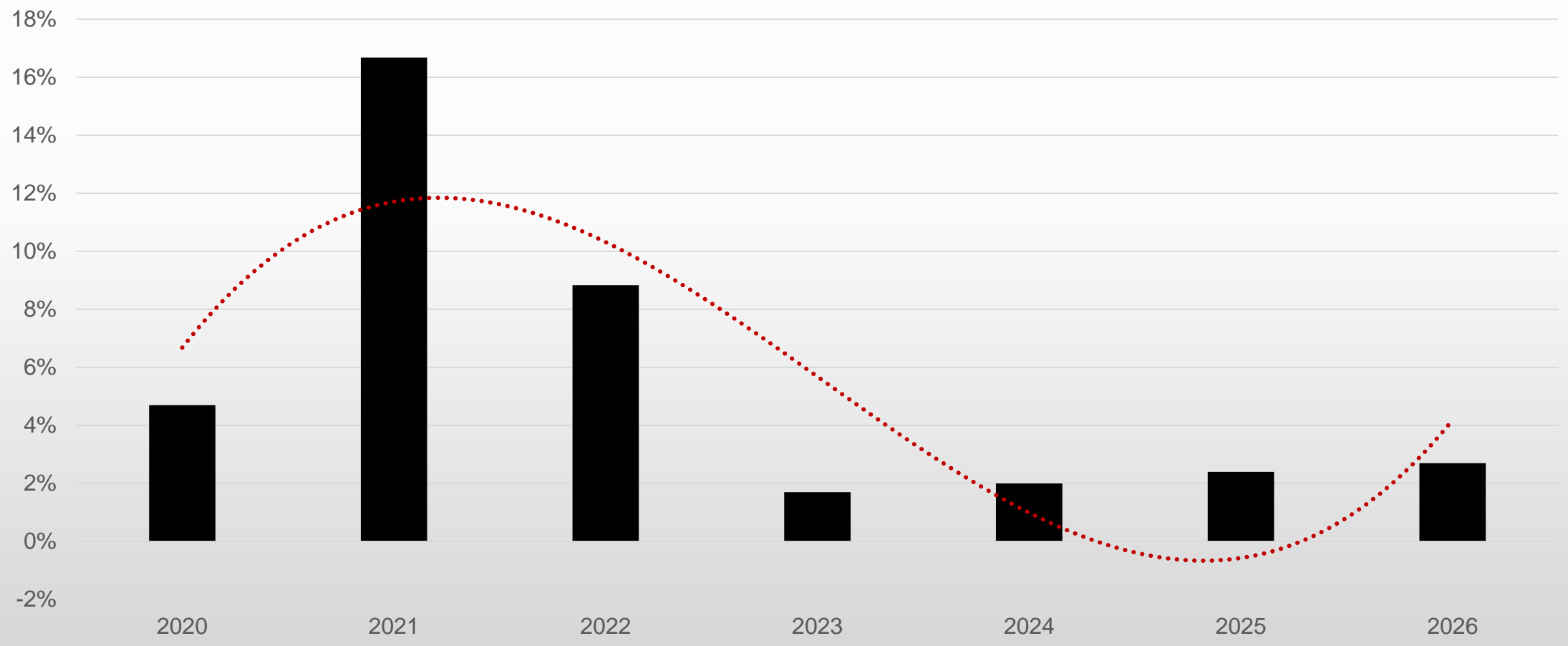
# Composition of Mortgage Rates Changes

## 100 Basis Points



# New Home Price Outlook

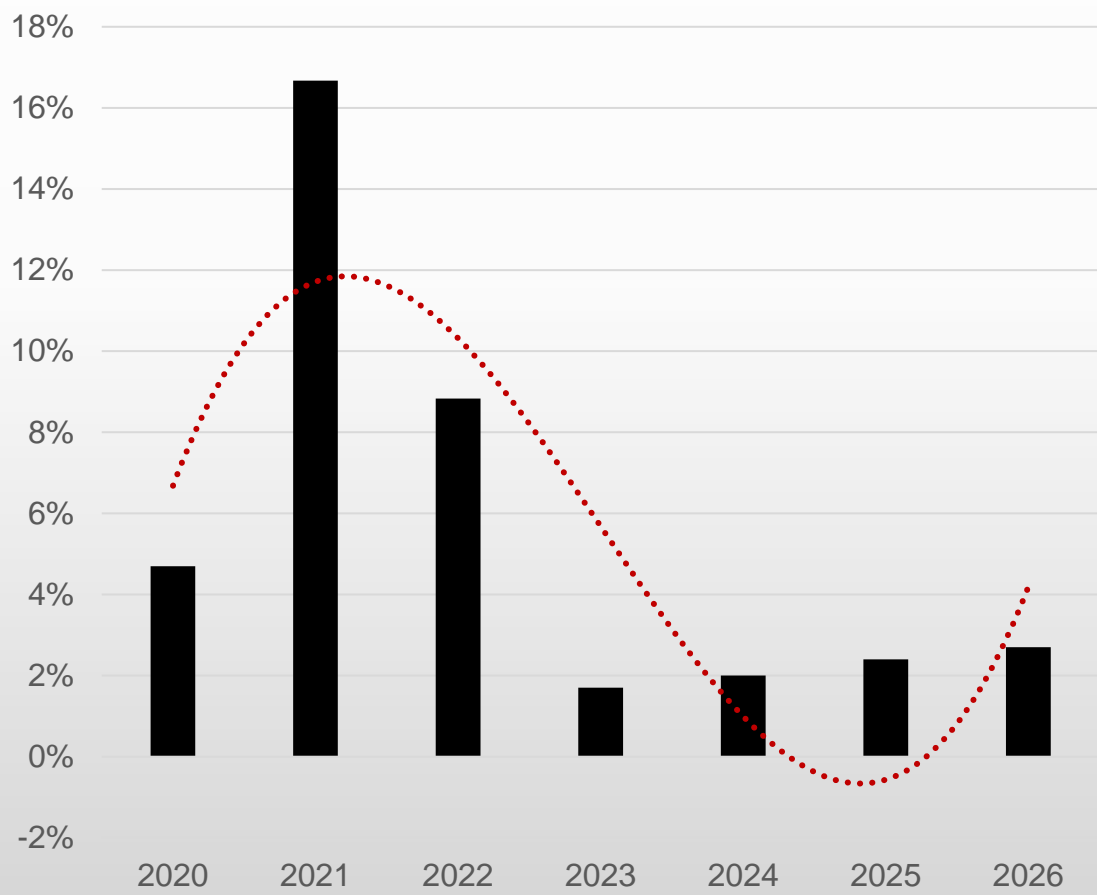
## Annual % Growth



# New Home Affordability

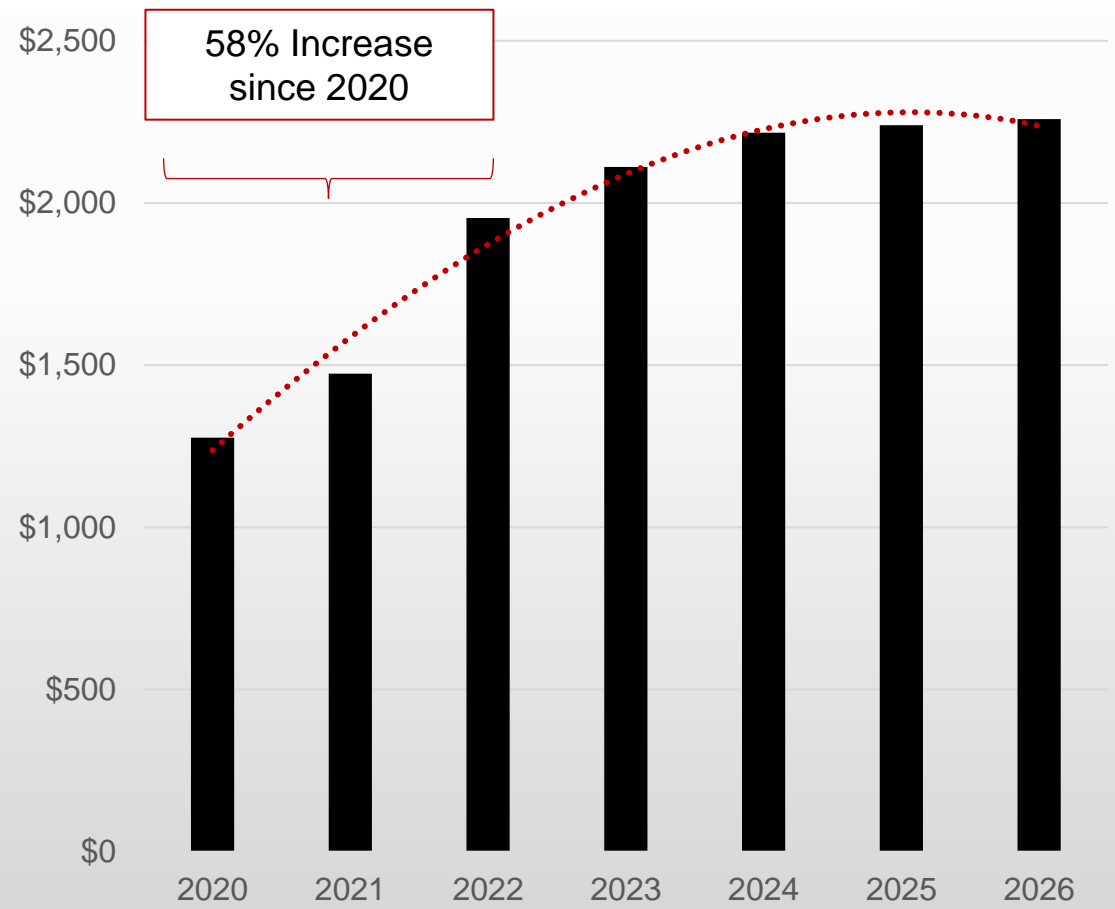
## New Home Price Outlook

Annual % Growth



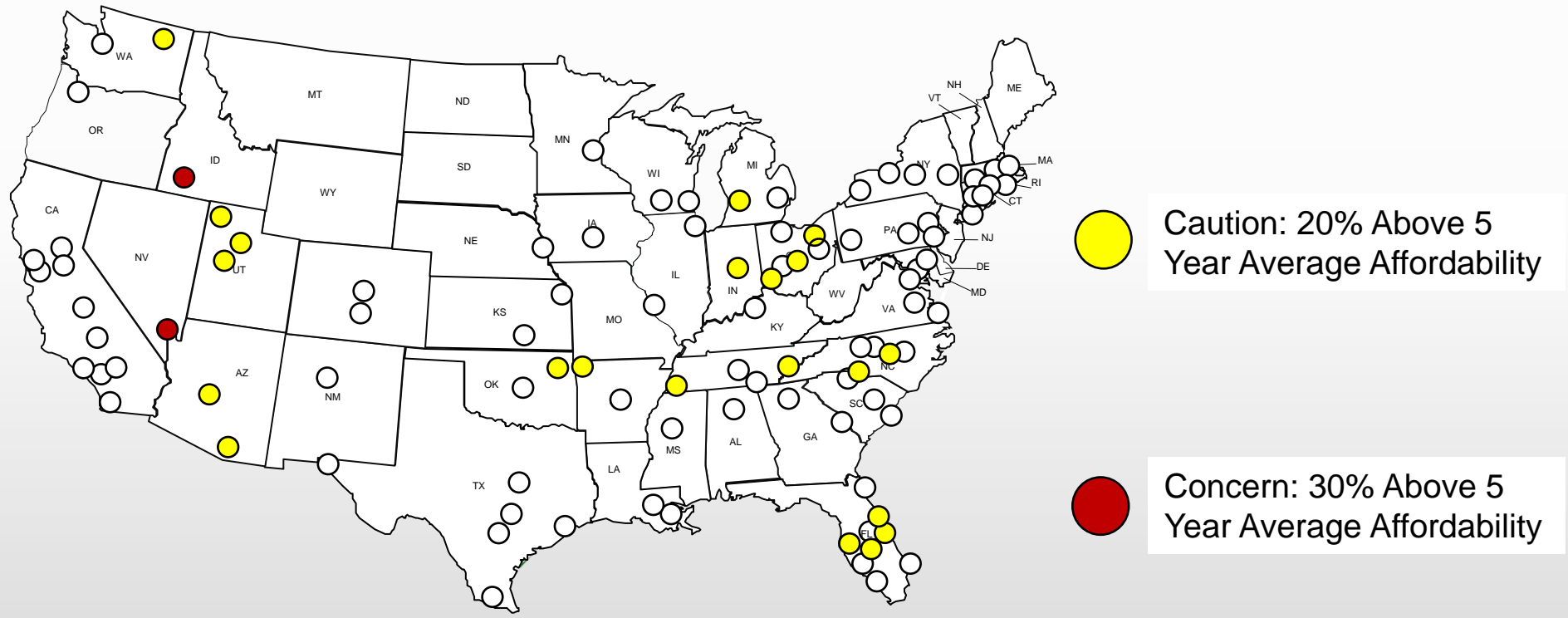
## Monthly Payment

Annual % Growth



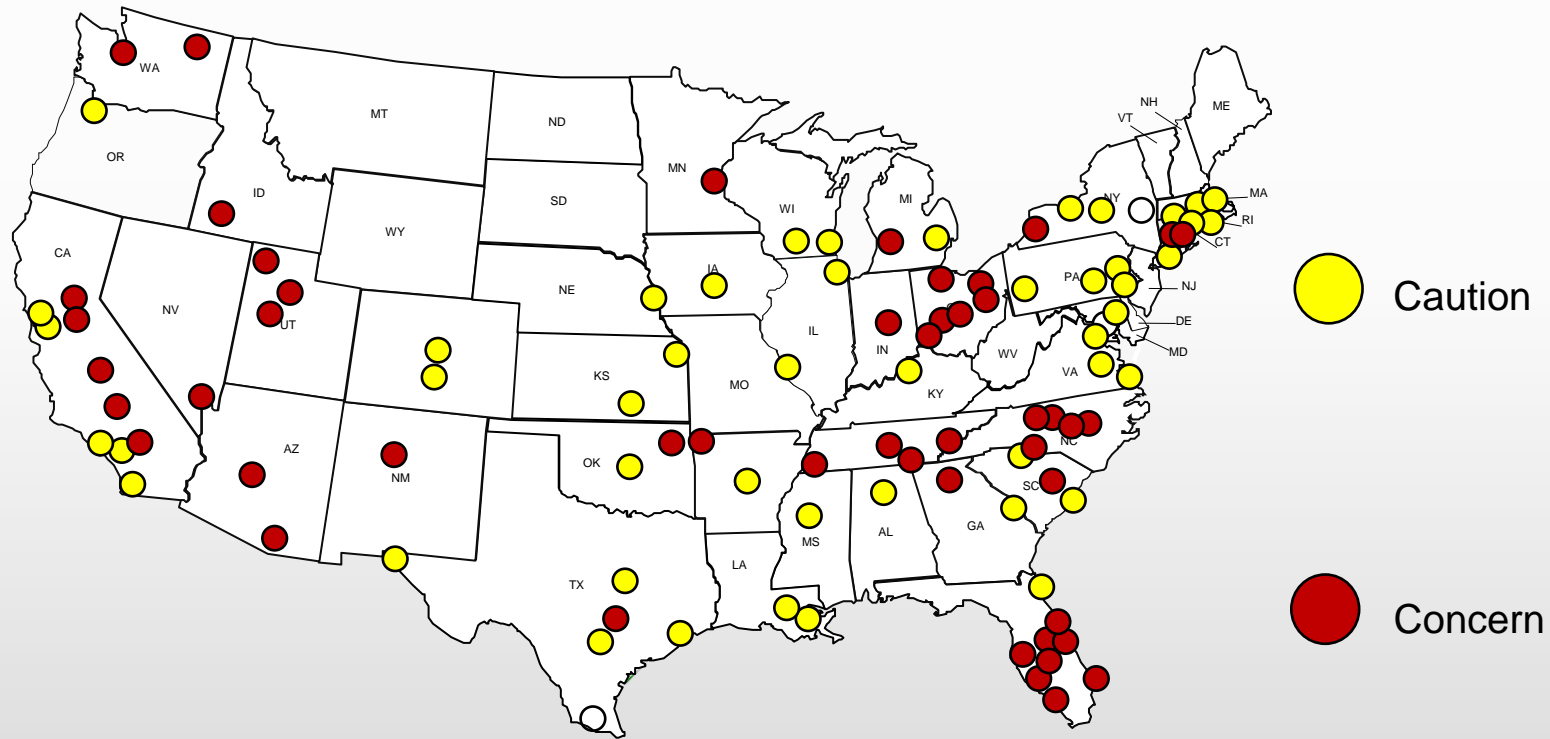
# Rising Mortgage Rate Impact on Affordability- 2021 (Conventional, 30 Year Fixed 3.4%)

Mortgage Payment Relative to Household Income (Top 100 MSAs)



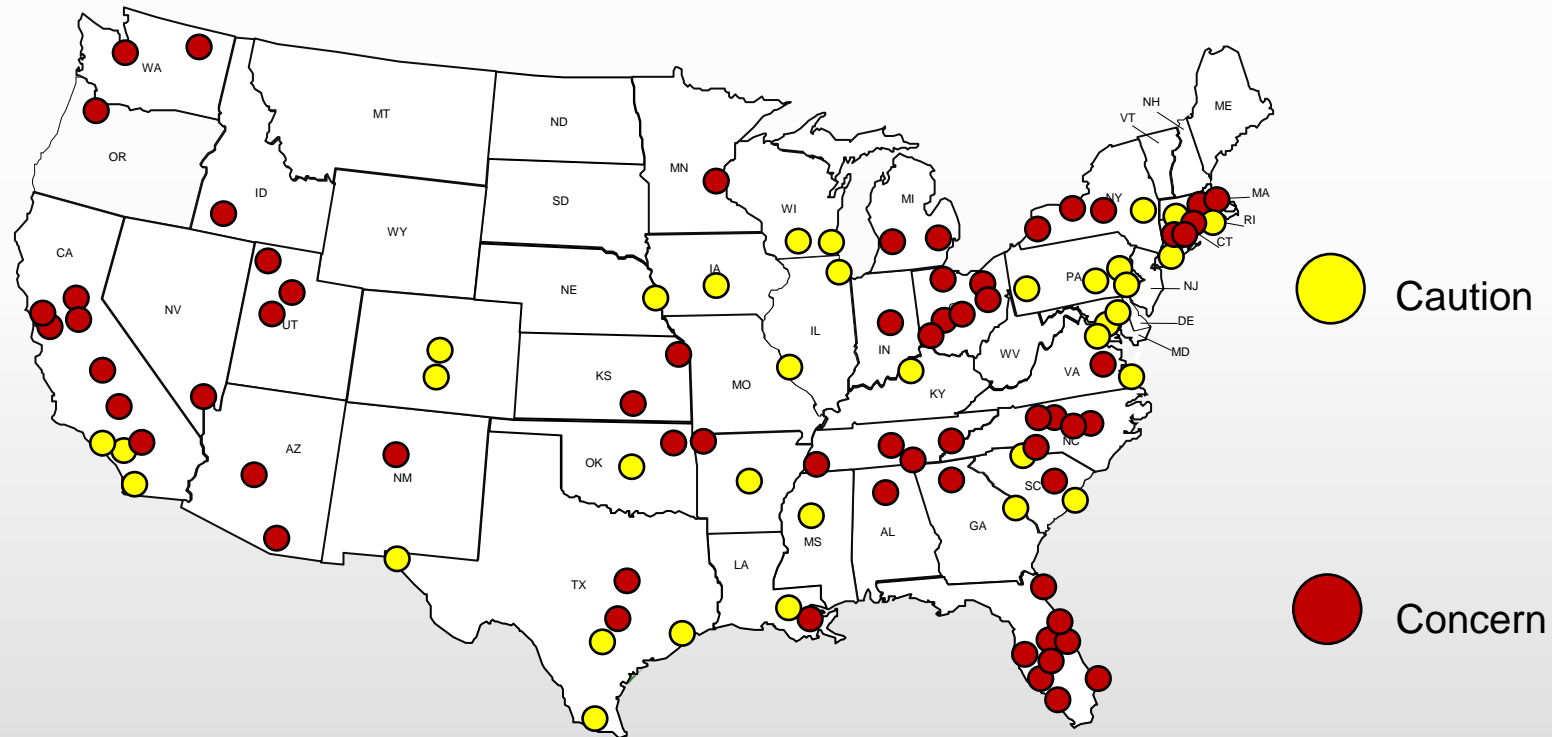
# Rising Mortgage Rate Impact on Affordability- 2022

(Conventional, 30 Year Fixed 4.6%)  
Mortgage Payment Relative to Household Income (Top 100 MSAs)



# Rising Mortgage Rate Impact on Affordability- 2023 (Conventional, 30 Year Fixed 4.9%)

Mortgage Payment Relative to Household Income (Top 100 MSAs)

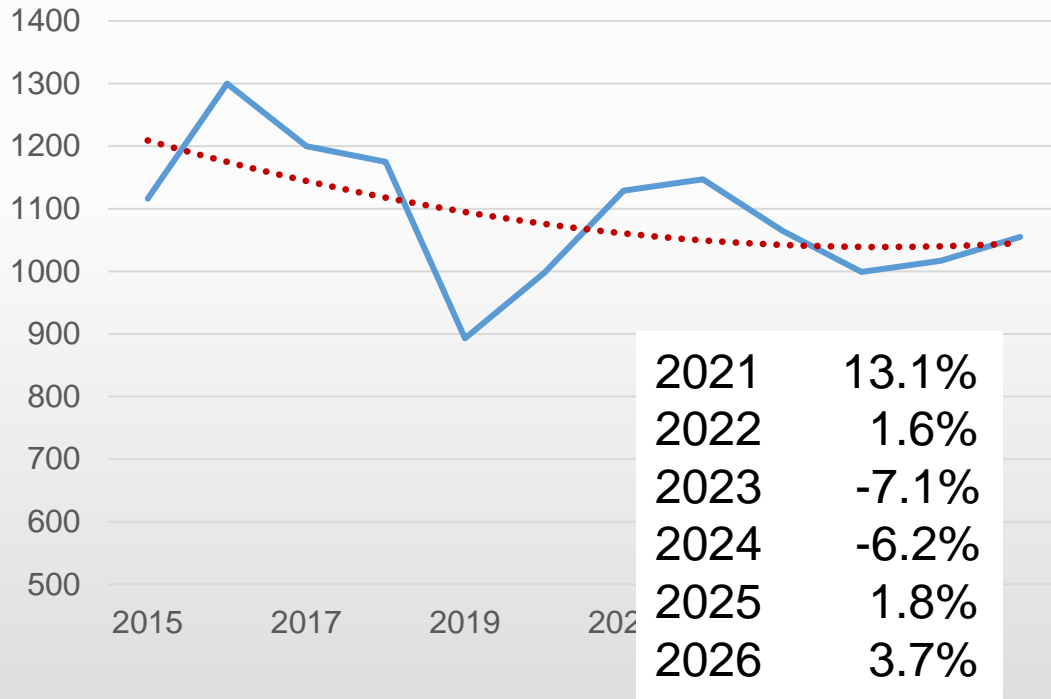




# Residential Outlook

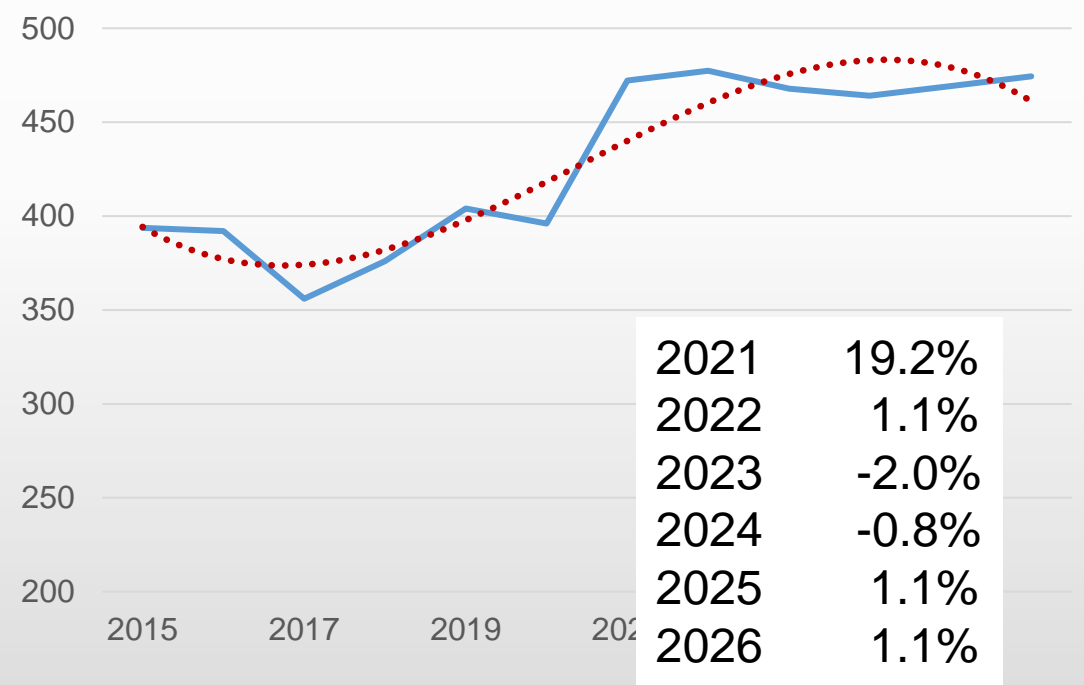
## Single Family Starts

Thousands



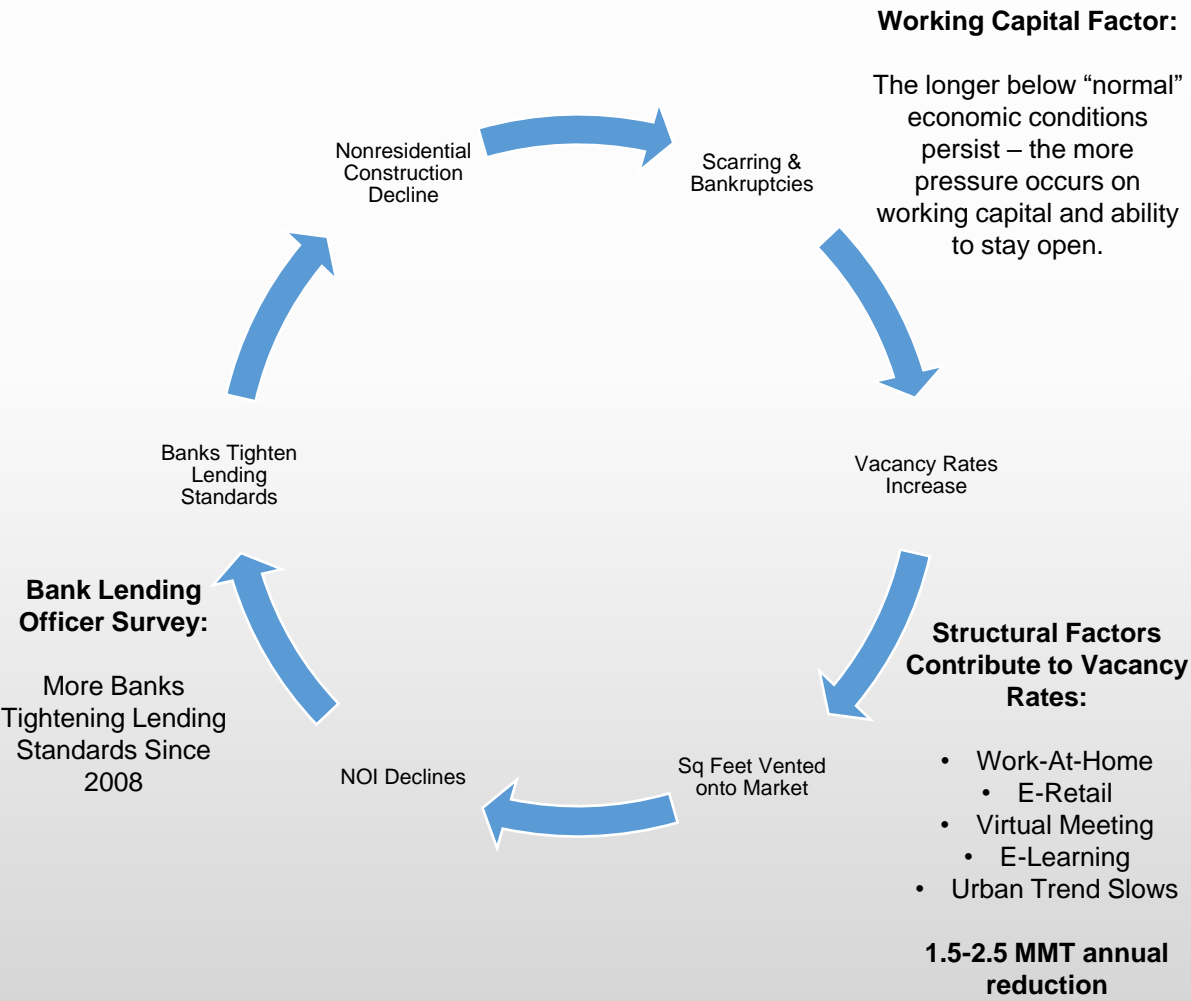
## Multifamily Starts

Thousands



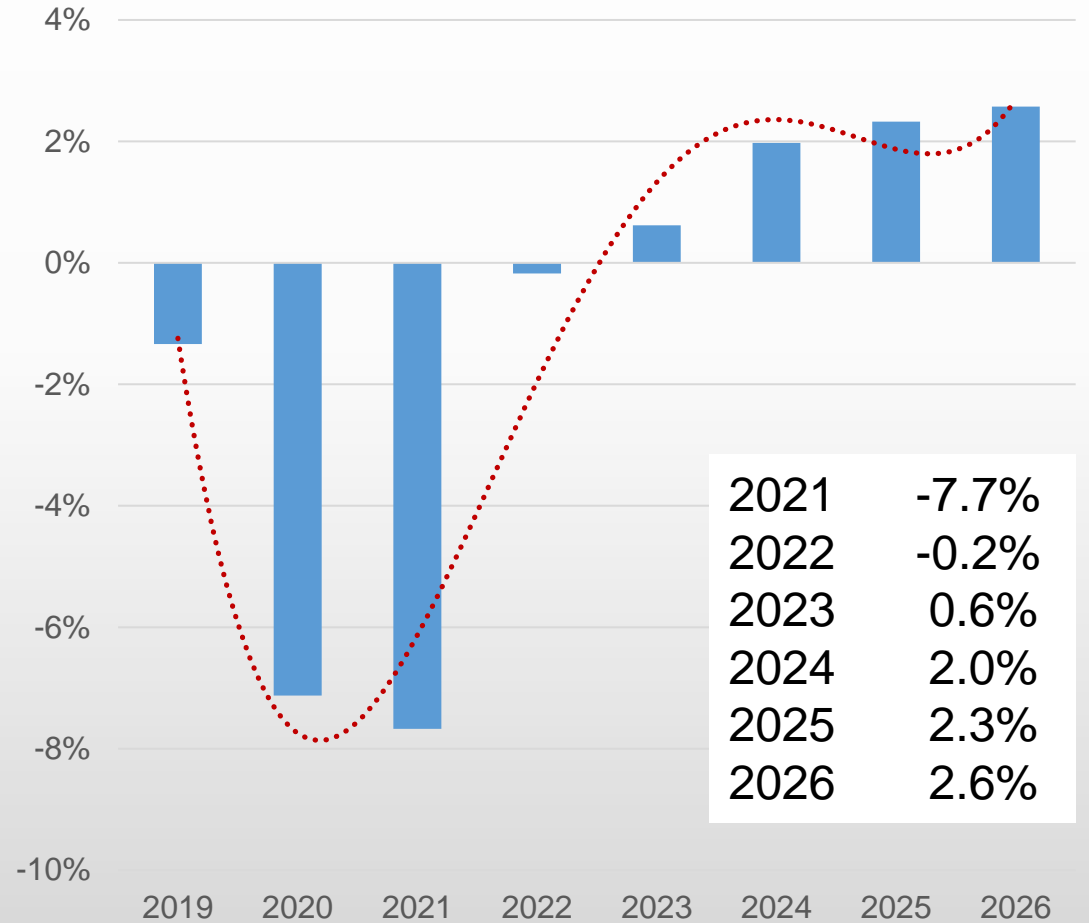
# Nonresidential

# Nonresidential Recovery Process



# Nonresidential Construction

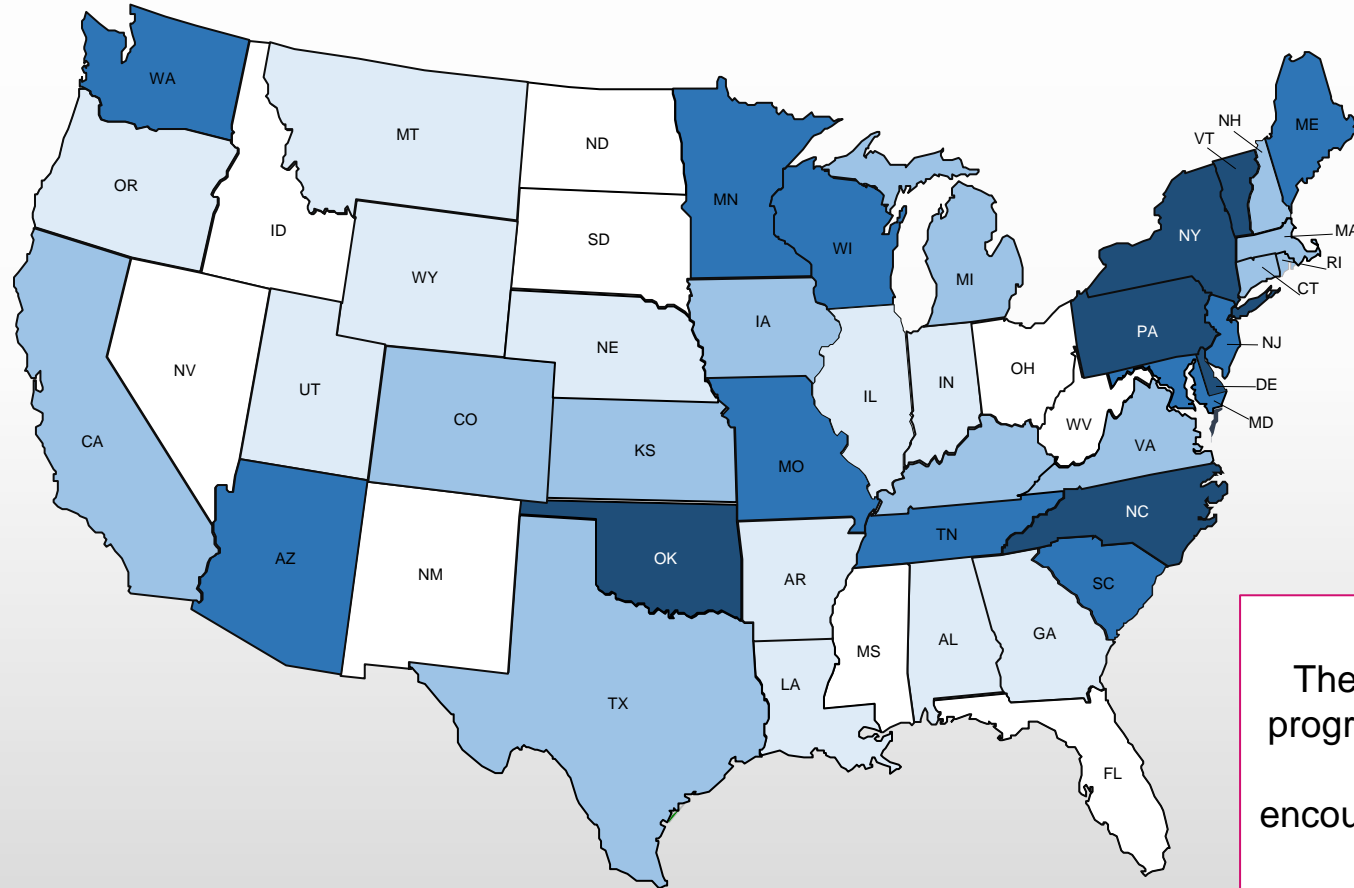
Real PIP, Y-O-Y Change



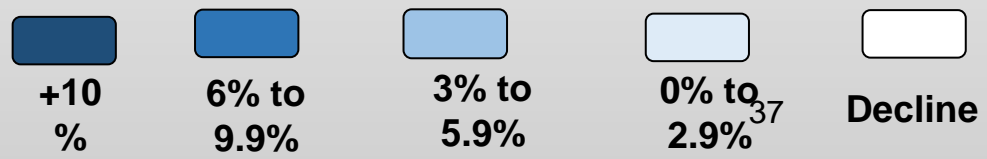
# Public

# Evolving State Fiscal Conditions

Percent **Increases** in General Fund Tax Revenues  
from Pre-COVID Levels



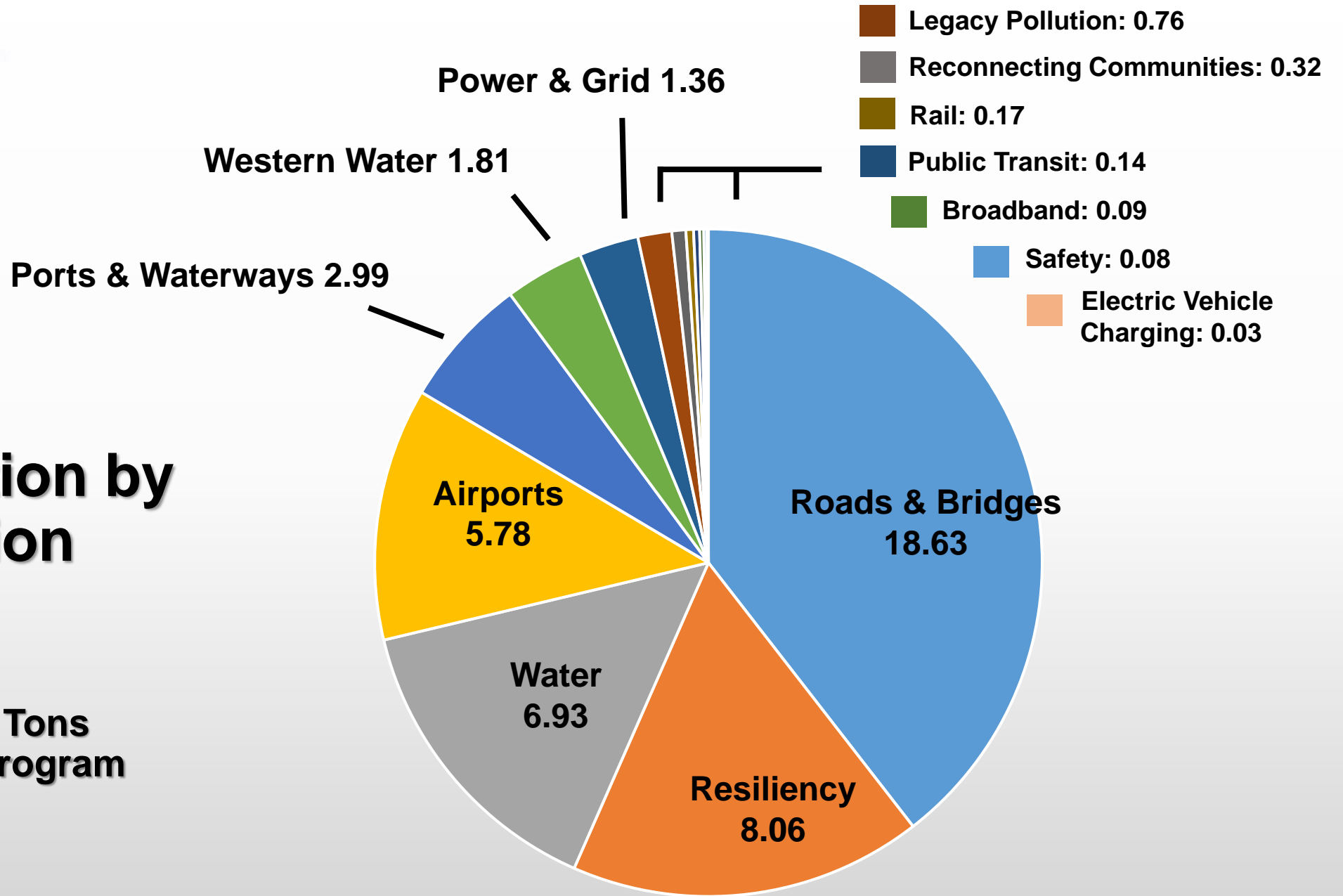
**Covid Relief:**  
The last Federal Covid Relief program included \$350 Billion to support fiscal duress encountered by states, countries, cities and tribes



# Infrastructure

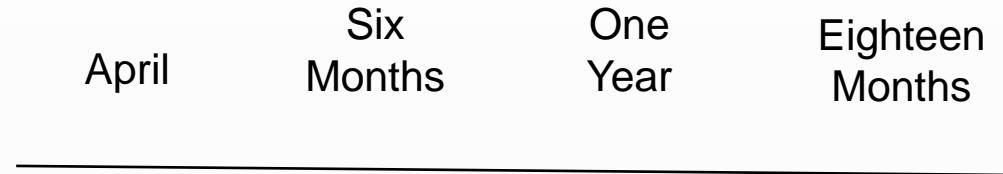
# Cement Consumption by Construction Sector

46 Million Metric Tons  
Over Five Year Program



# There Will Be a Wait for Pouring to Begin

Small Volumes of cement consumption associated with the program materialize in second half 2022.



4-9 Months

Federal & State Paperwork



Roughly 38% occurs through competitive grants.

Bid Letting & Review



Contract Award to Construction



Average Construction Start: **Early/Mid-2023**



# Infrastructure Timing Distribution

## Highway & Bridges

This is an Representation of the process and not actual numbers.

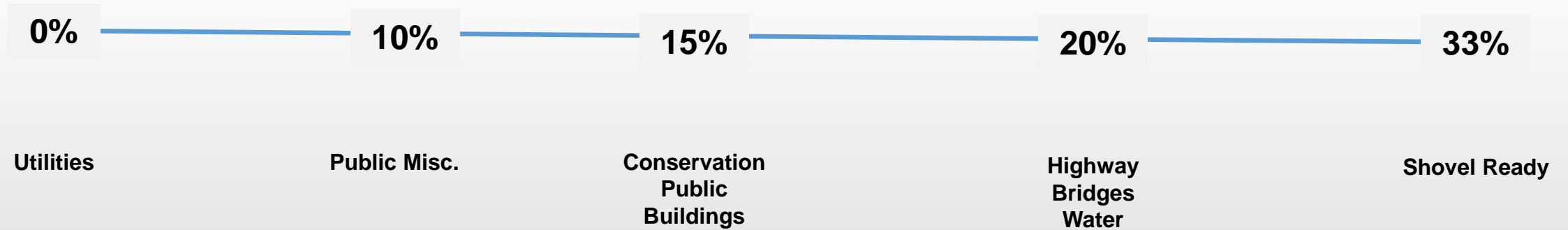
Process repeated across all construction segments that are impacted by the Infrastructure Program

	Spending Allocation Billion \$	Fiscal Year Spending				Total Spent	Total Spent
		2023	2024	2025	2026		
		Year	Year	Year	Year		
		1	2	3	4		
		21%	43%	22%	14%		
2023	\$20	\$4	\$9	\$4	\$3	\$20	100%
2024	\$20		\$4	\$9	\$4	\$17	86%
2025	\$20			\$4	\$9	\$13	64%
2026	\$20				\$4	\$4	21%
2027	\$20				---		
<b>Total Spending</b>	<b>\$100</b>	<b>\$4</b>	<b>\$13</b>	<b>\$17</b>	<b>\$20</b>		

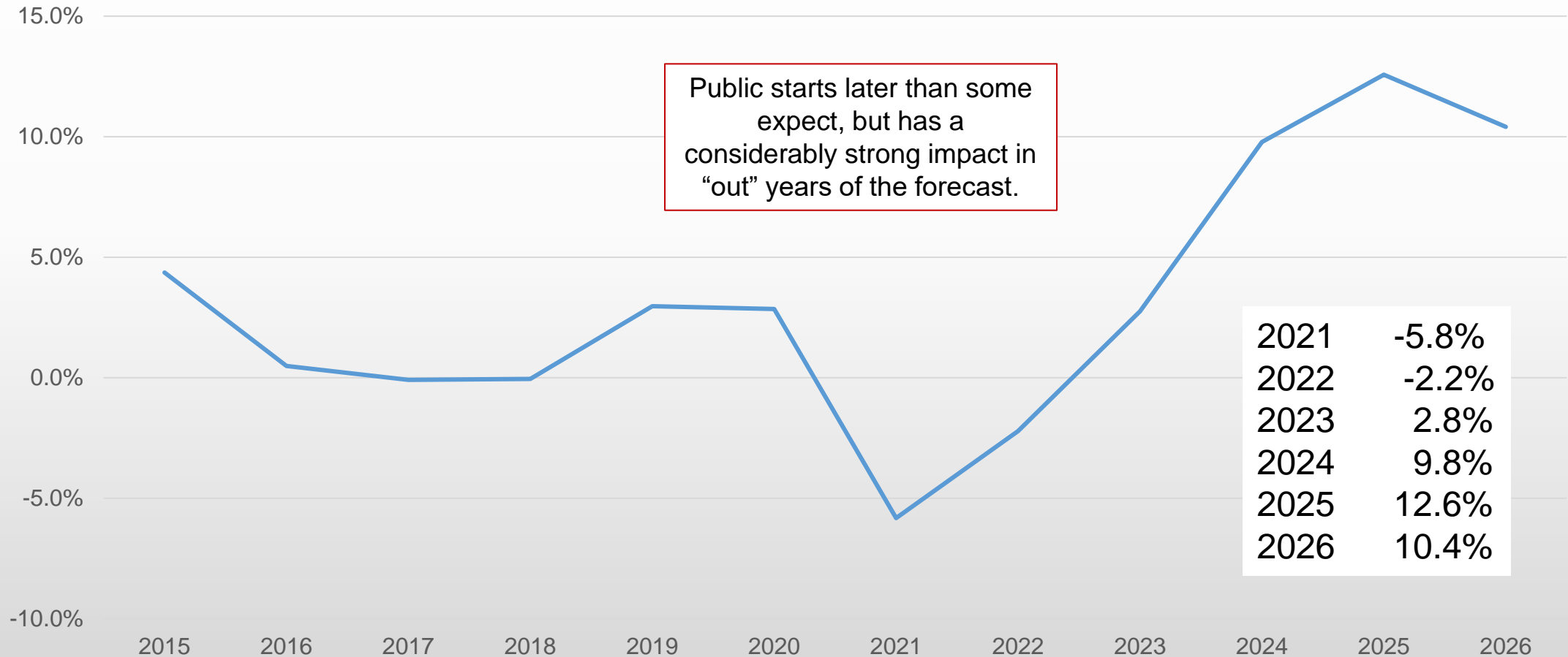
# S&L Sterilization

Percentage Foregone

TEA/SAFETY-LU:	31%
ARRA:	81%



# Public Construction Spending Put-In-Place Real \$



# Outlook

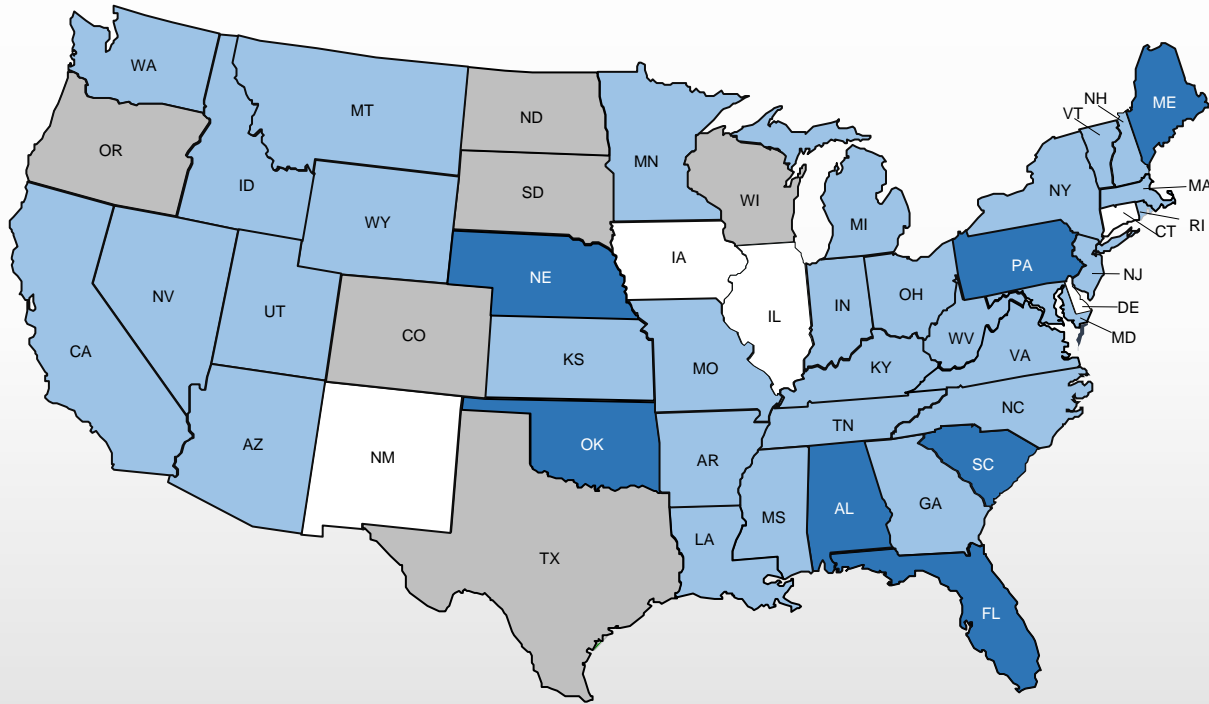
# Baseline US Cement Consumption Outlook

## Baseline Annual % Growth



# Cement Consumption

%, YTD through December 2021



## 2021 Growth Rates By Region

West North Central	3.5%
West South Central	-0.3%
New England	4.6%
East North Central	1.9%
Middle Atlantic	8.2%
South Atlantic	9.2%
East South Central	8.8%
Pacific	1.6%
Mountain	4.3%
<b>United States</b>	<b>4.1%</b>

# Alternatives

There is such high levels uncertainty these “scenarios” are offered as a measure of risk that can be attached to the baseline.

Ukraine Occupation Only  
(Baseline)

**Key Assumptions:**

- Russia occupies Ukraine
- Ukraine resistance continues
- Oil WTI peaks at \$115 per barrel.
- Revoke Russia MFN Status
- Aggression constrained to Ukraine
- No cyberattacks
- No nuclear

**Potential Impacts:**

- Key commodities rise significantly
- Additional disruption to supply chain
- Inflation higher
- Real wage declines
- Slower global growth
- Sustained increases in interest rates
- Cement consumption growth slows
- **Growth slowdown. No recession**

War Expands

**Key Assumptions:**

- NATO attacked resulting in a hot war
- Cyberattacks disrupt US economy
- Russian Oil Shunned
- Inflation increases
- Global growth recession ensues
- US demand destruction materializes

**Potential Impacts:**

- Consumer Sentiment worsens versus baseline
- Investment spending slows considerably
- Cement consumption experiences moderate decline
- **Recession**

Everything Works

**Key Assumptions:**

- Diplomatic Solution in Ukraine.
- Covid drastically reduced mid-year.
- Pent-up demand released late 2022
- Rapid Supply-Chain Improvement.
- OPEC Plus adds to Global Oil Production
- Labor Participation accelerates
- Inflation eases faster than baseline
- Fed less aggressive on Fed Funds

**Potential Impacts:**

- Stronger economic growth
- Lower inflation
- Slower increase in interest rates
- Impact on private construction muted.
- Stronger Cement Consumption
- **Growth Slows then accelerates.**



# Scenario: War Expands

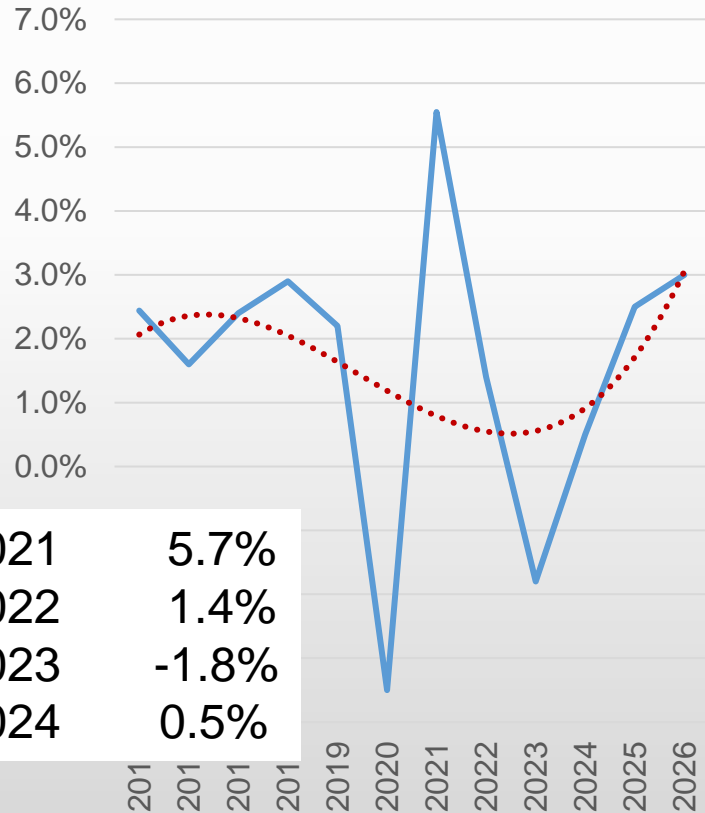
*War scenario assumes hostilities start with economic warfare (cyberattacks) followed by “hot war” initiated by Russian attack on a NATO country. Cyber attacks assumed third to begin third quarter 2022, “Hot War” fourth quarter 2022. Prolonged war. No Nuclear.*

- **Cyberattacks** begin 2<sup>nd</sup> half of 2022. Attacks double from existing levels. Reduces economic growth by -0.1% in 2022 and -0.3% in 2023.
- **Russian Oil Shunned.** Oil Prices rise to \$200 per barrel. Direct impact reduces GDP growth -0.86% in 2022 and -1.4% in 2023.
- **Inflation rate boosted** 150 BP over baseline in 2022 and 200 BP in 2023. Interest rates rise similarly.
- **Consumer spending retreats** due to oil, interest rates, and sentiment. Gasoline Prices exceed \$9 per gallon. Consumer Sentiment drops 35% within six months of hostilities. Reduces GDP growth by -1.2% in 2022 and -1.6% in 2023.

# Scenario: War Expands

## GDP Growth

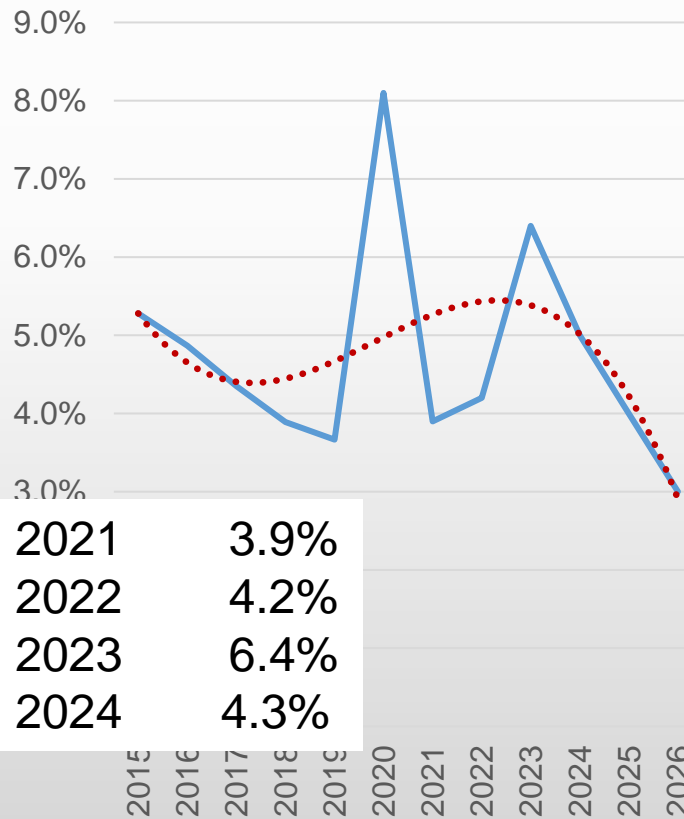
Real GDP Annual Growth



2021	5.7%
2022	1.4%
2023	-1.8%
2024	0.5%

## Unemployment Rate

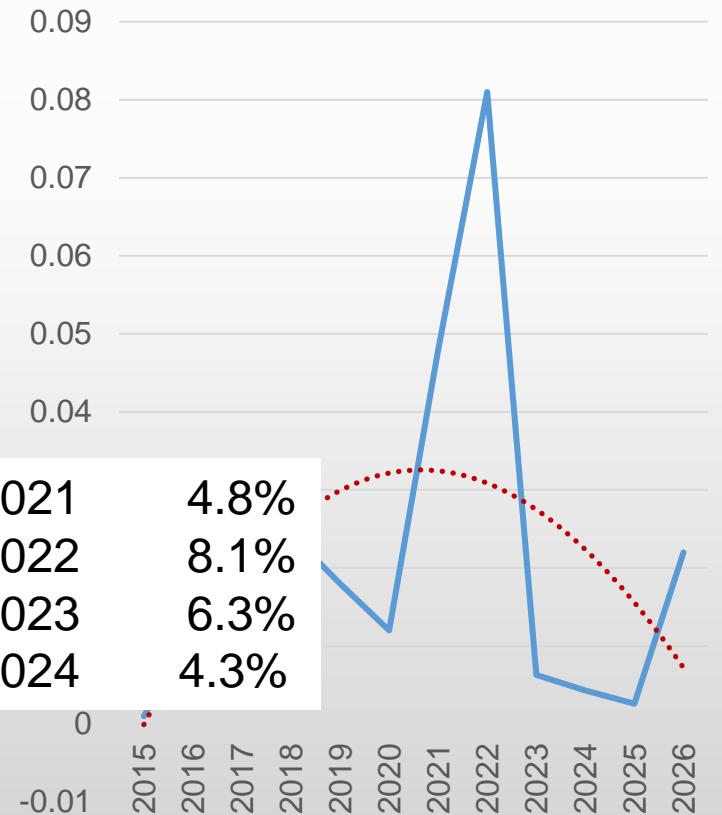
Percent Unemployed



2021	3.9%
2022	4.2%
2023	6.4%
2024	4.3%

## Inflation Rate

CPIU, Annual Percent Change



2021	4.8%
2022	8.1%
2023	6.3%
2024	4.3%

# Scenario: Everything Works

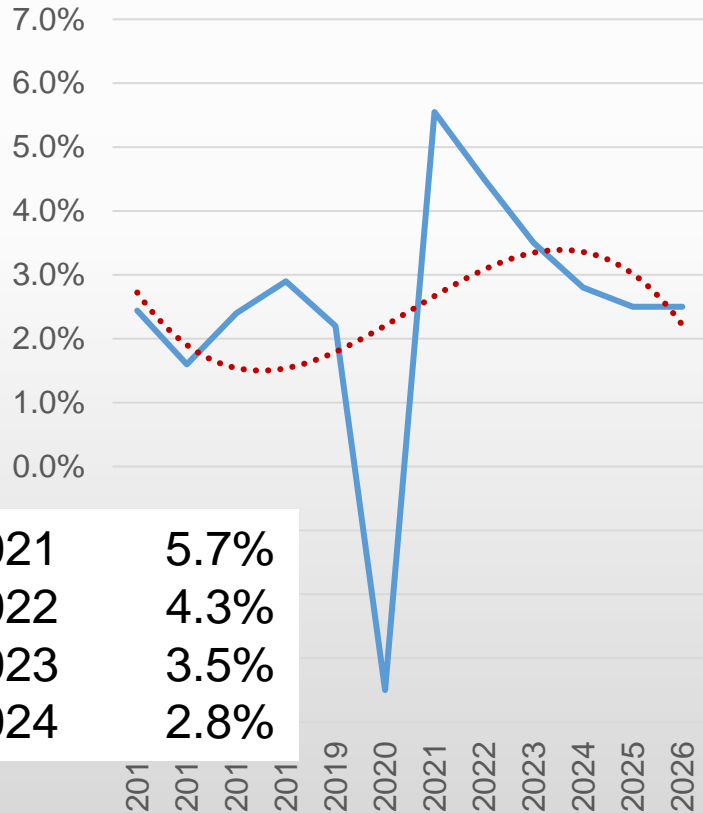
*Everything works scenario assumes a quick diplomatic solution to Russia-Ukraine hostilities, an improvement in inflation and interest rates rise at a slower pace.*

- **Covid retreats.** IHME projections are correct and covid virtually disappears by mid-year. Improvement for US and Globally.
- **Supply chain improvements accelerate** due to improvement in covid. Inflation declines and US rate reaches 3% in 2023.
- **Federal Reserve takes a less aggressive policy stance** in light of lower inflation. Inflation expectations ease. Risk premiums ease. Interest rates rise at a slower pace versus baseline.
- 
- **Consumer spending accelerates.** With covid retreat, pent-up demand released. Strong consumer position enhanced by lower inflation, lower interest rates, strong labor market conditions, and cessation of hostilities in Europe.

# Scenario: Everything Works

## GDP Growth

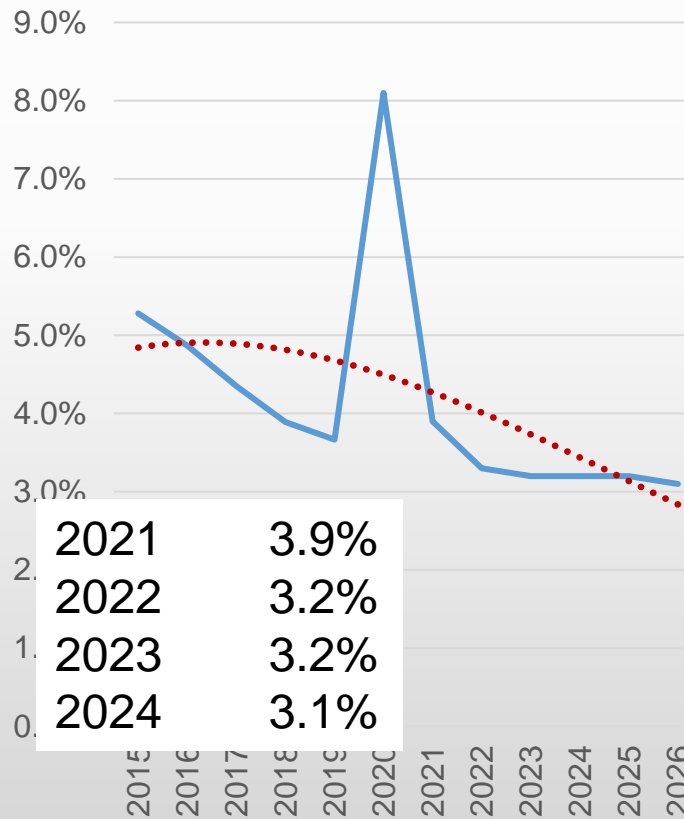
Real GDP Annual Growth



2021	5.7%
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2023	3.5%
2024	2.8%

## Unemployment Rate

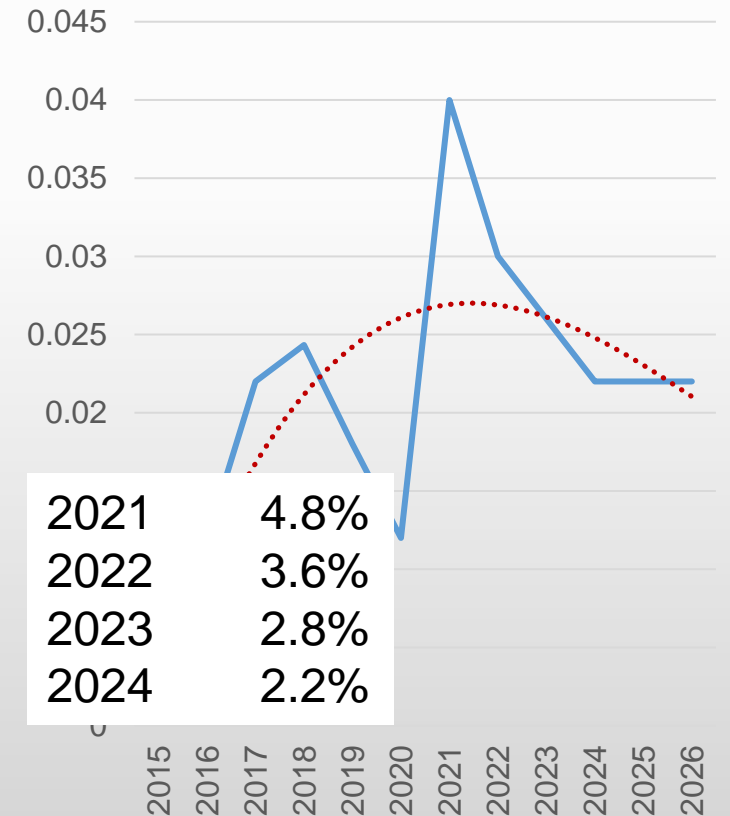
Percent Unemployed



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## Inflation Rate

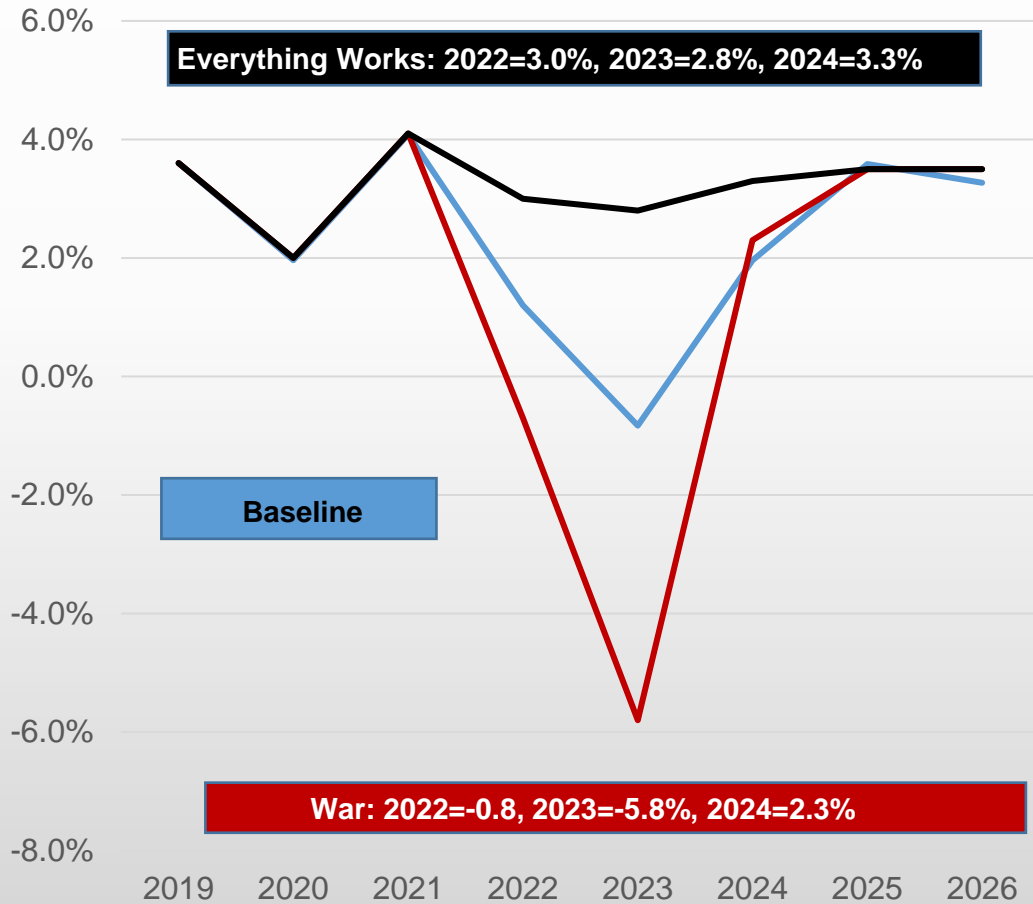
CPIU, Annual Percent Change



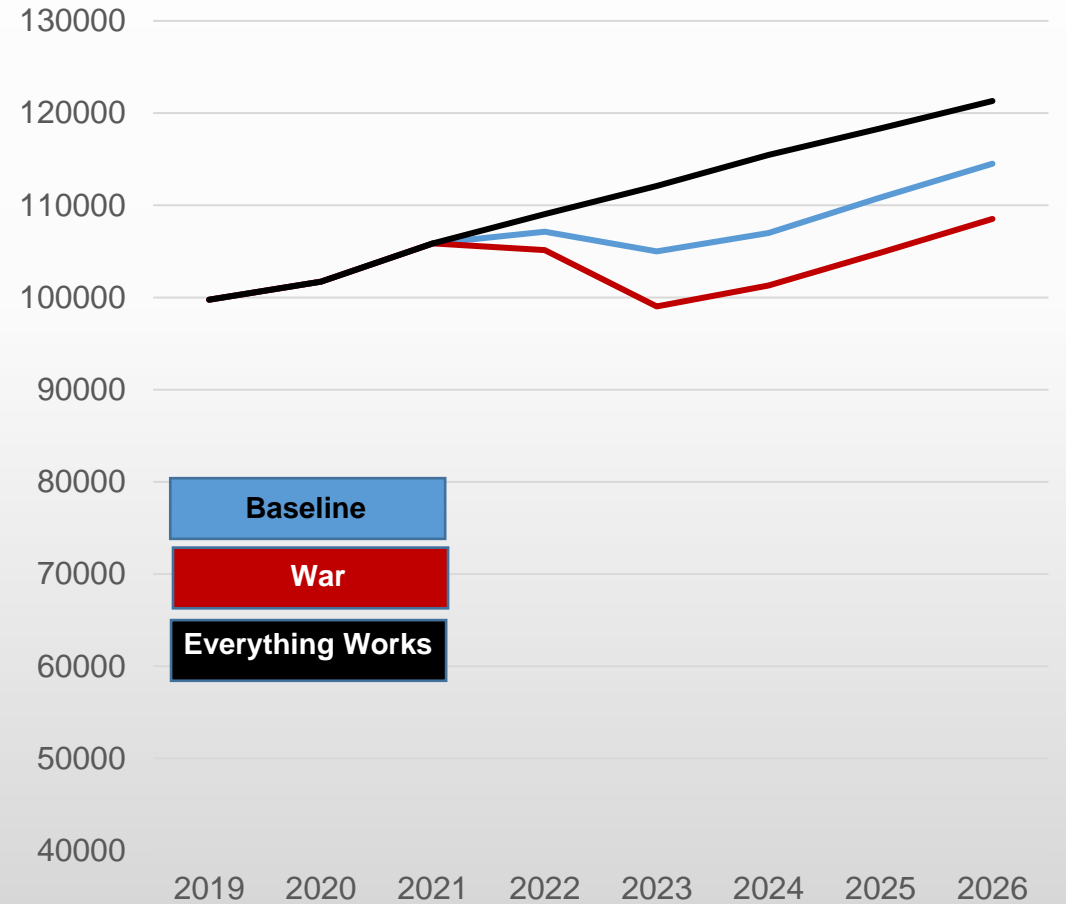
2021	4.8%
2022	3.6%
2023	2.8%
2024	2.2%

# Scenario Comparisons

## Annual Growth Rates



## Volume, Thousand MT



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*Since 1916*

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## Cement Outlook

Ed Sullivan, SVP & Chief Economist