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Fall Cement Outlook

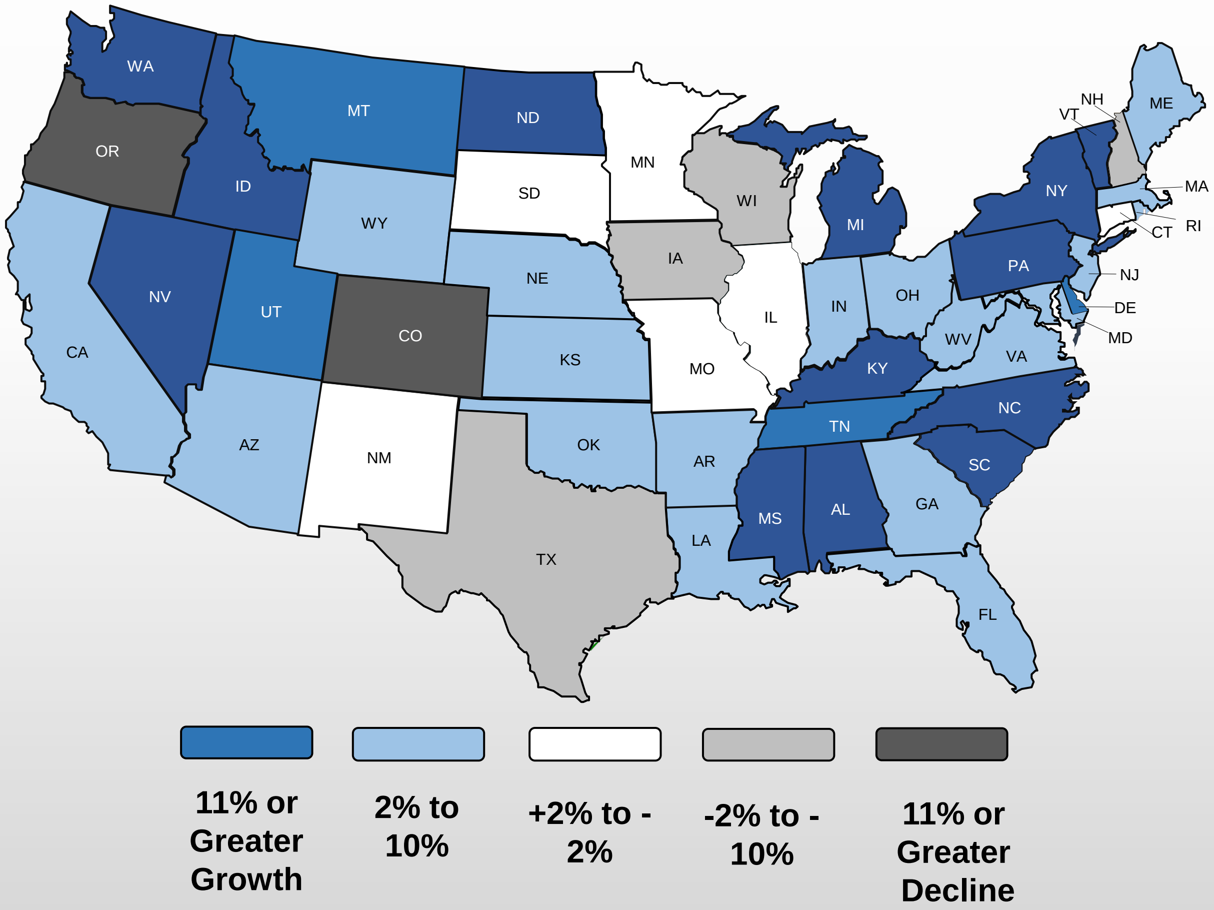
October 1, 2021

Ed Sullivan, SVP & Chief Economist

Introduction

Cement Consumption

%, Implied YTD through August 2021



Growth Rates By Region YTD – August

West North Central	2.0%
West South Central	-1.2%
New England	2.0%
East North Central	1.5%
Middle Atlantic	8.2%
South Atlantic	8.7%
East South Central	11.1%
Pacific	5.9%
Mountain	5.3%
United States	**4.5%**

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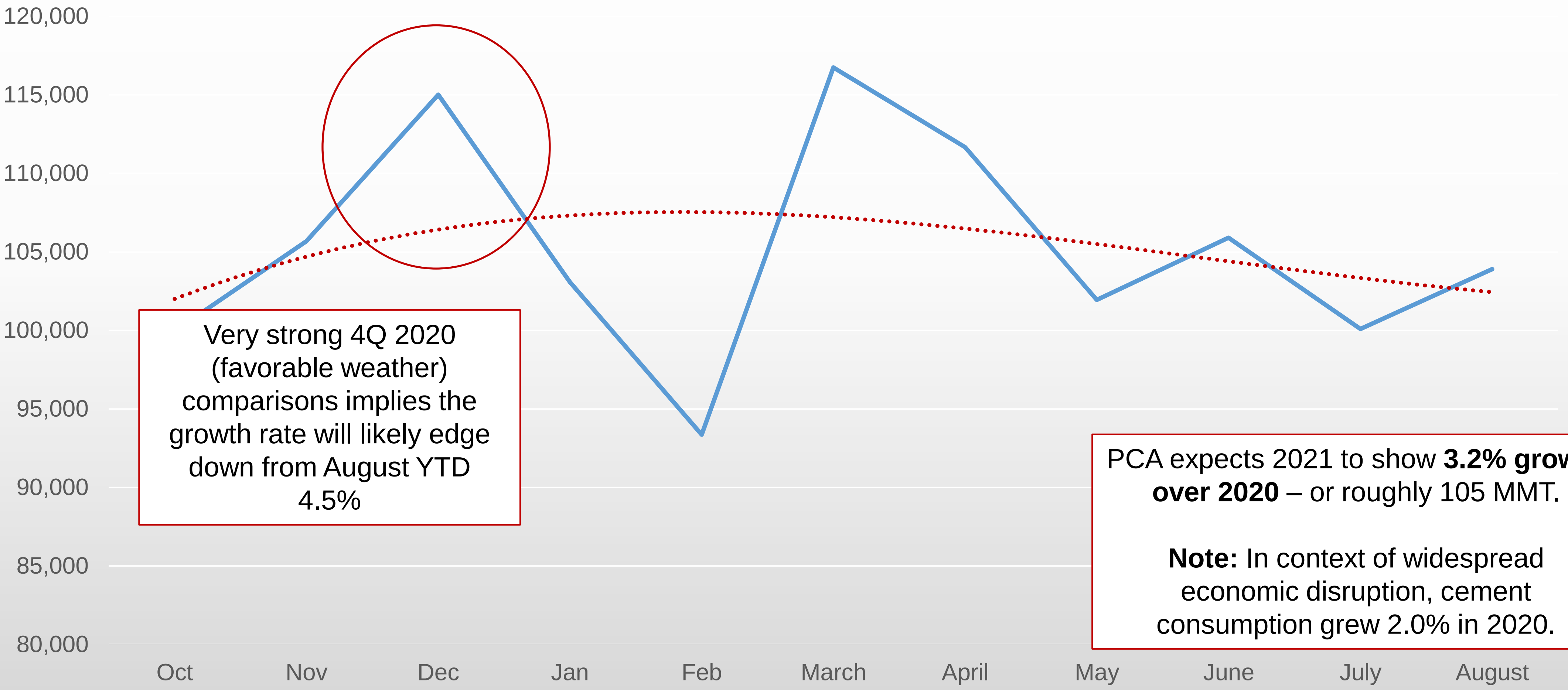
Cement Consumption
SAAR



Very strong 4Q 2020 (favorable weather) comparisons implies the growth rate will likely edge down from August YTD 4.5%

PCA expects 2021 to show **3.2% growth over 2020** – or roughly 105 MMT.

Note: In context of widespread economic disruption, cement consumption grew 2.0% in 2020.

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Delta Virus Impacts on Economic Activity

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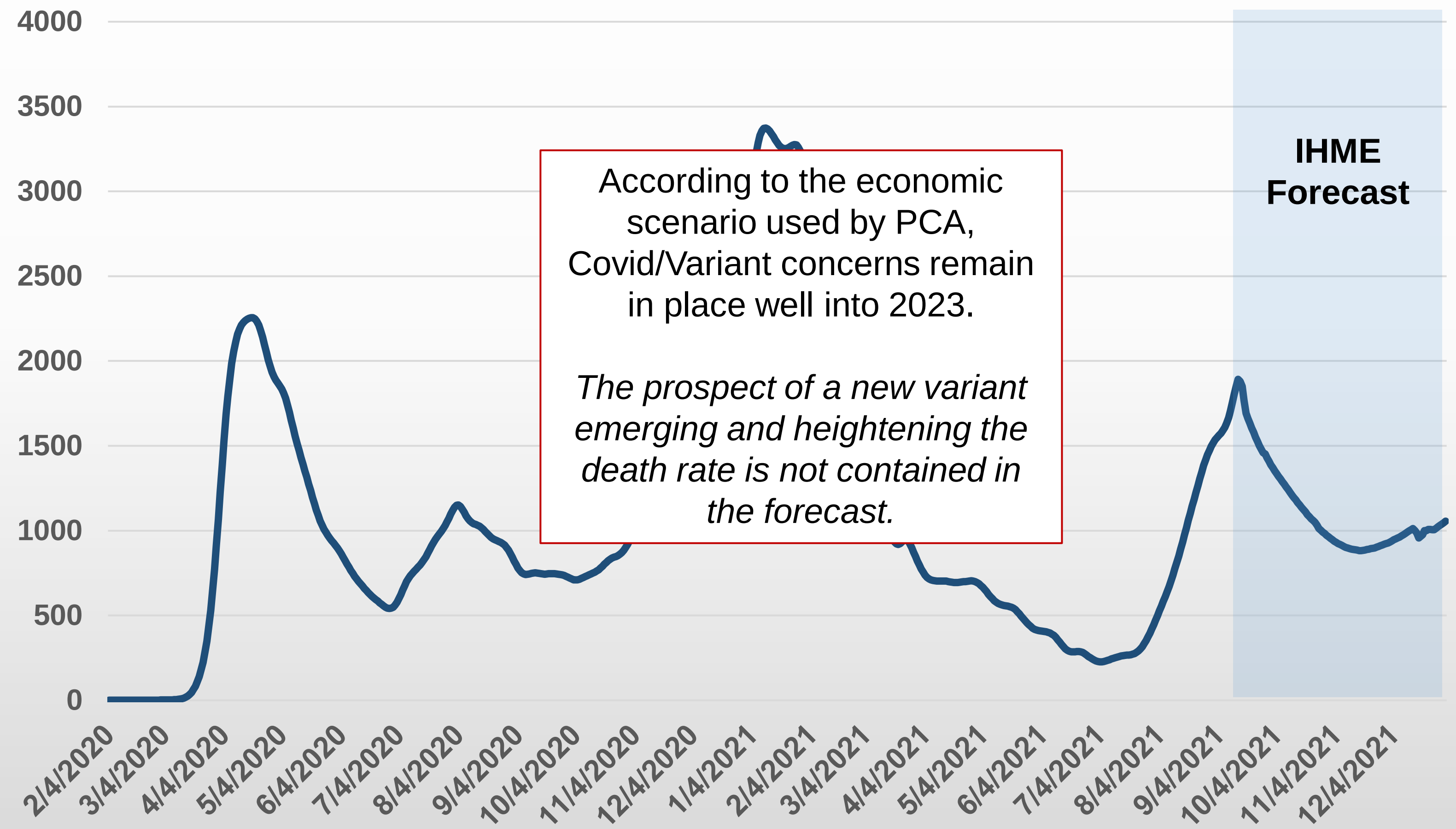
Confirmed & Projected COVID Deaths

U.S. Coronavirus Deaths; 7-day moving average; IHME Projections



According to the economic scenario used by PCA, Covid/Variant concerns remain in place well into 2023.

The prospect of a new variant emerging and heightening the death rate is not contained in the forecast.

Extending the IHME Forecast Through 2022

Use the Average Rate of Decline Oct-Dec

Jan	**1018**
Feb	**917**
Mar	**825**
April	**742**
May	**668**
June	**601**
July	**541**
Aug	**487**
Sept	**438**
Oct	**394**
Nov	**355**
Dec	**320**

This assumption can have a significant impact on the macroeconomic outlook.

2023.

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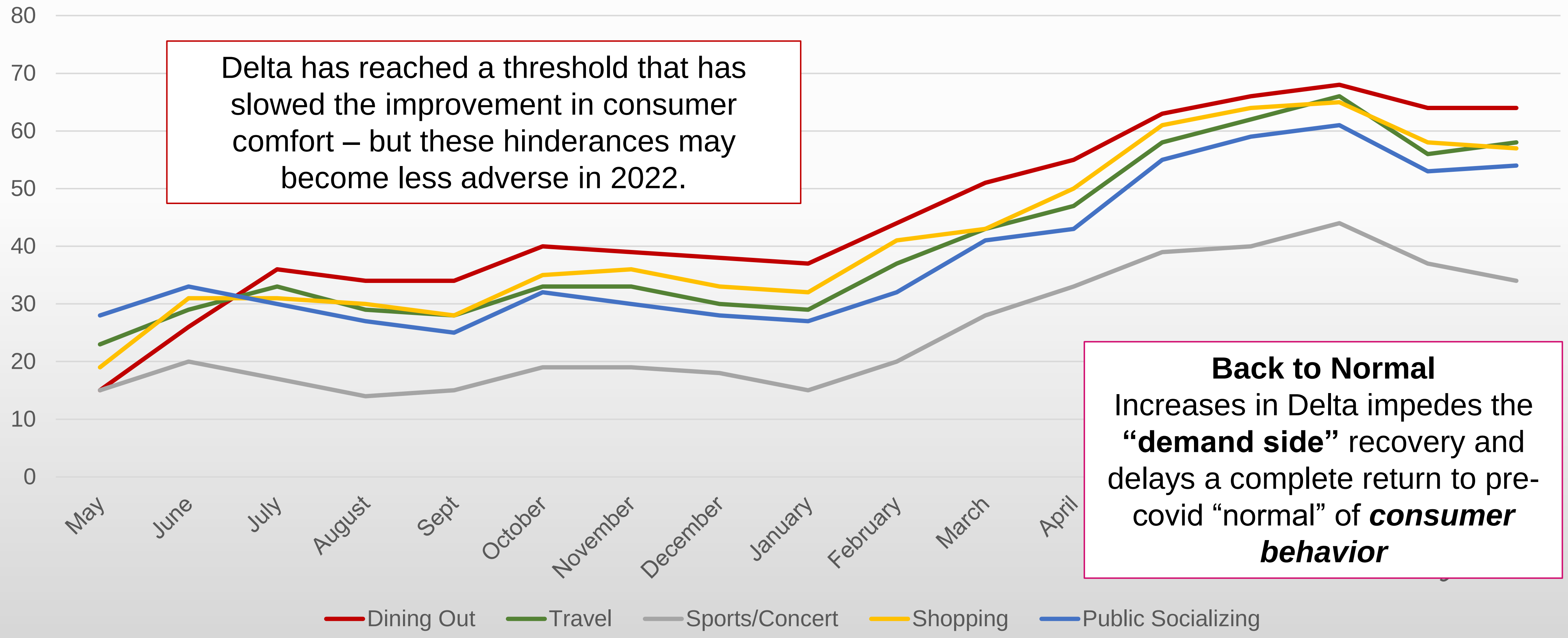
Consumer Comfort

Morning Consult, % All Adults



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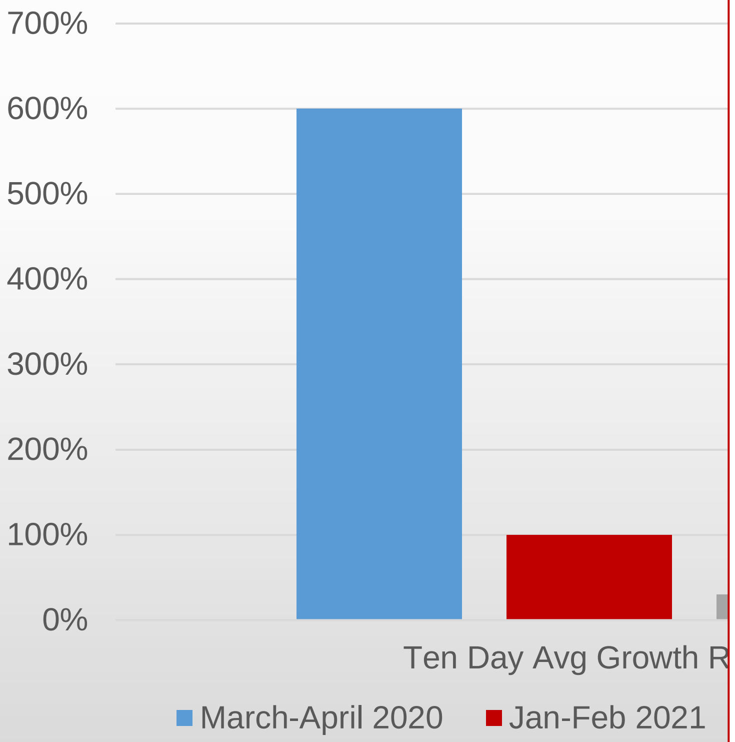
Wide Spread Shutdowns are Unlikely

Rate of Daily Death Increase When Shutdowns Materialized
- Total Covid Deaths Rolling 10 Day Average



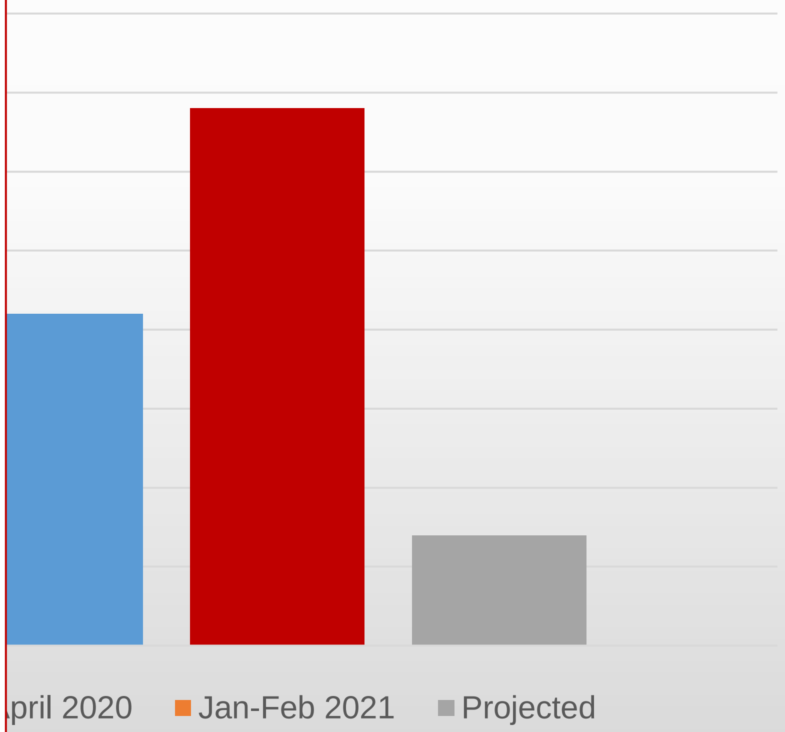
Be careful of semantics.

This assessment applies only to shutdowns. And does not include expanded mask mandates and other initiatives aimed at slowing the viral spread.

Shut downs can have a large adverse impact on economic activity.

The other policy initiatives have a minimal adverse impact on economic activity.

Level of Daily Death When Shutdowns Materialized
- Total Covid Deaths



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Supply Side Constraints

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The Economy Struggles to Reawaken

Shortages and supply chain issues characterize the nation's ability to meet strengthening demand, impacting everything from computer chips to lumber to restaurant services. The reasons are typically :

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- Strong demand
- Production cutbacks and delayed maintenance during Covid,
- Weather conditions that led to a disruption of production,
- Under-build of inventories
- Logistic hinderances on the roads, waterways and rails
- Labor force constraints & worker shortages.

Cement is Not Immune to these Economy Wide Supply-Side Hinderances

- Many states have reported market tightness.
  - Other states are teetering

- Under build of inventory is the crux of the problem
  - Strong demand
  - Covid-related production disruptions

- Logistic hinderances have slowed the flow of product to market
  - Trucking & waterborne

- Tightness reflects a unique period.
  - Common amongst many industries reawakening from Covid
  - Expected to persist through 2021, with an opportunity to rebuild inventories this winter.

Labor, Logistics & Product Markets

Labor Markets

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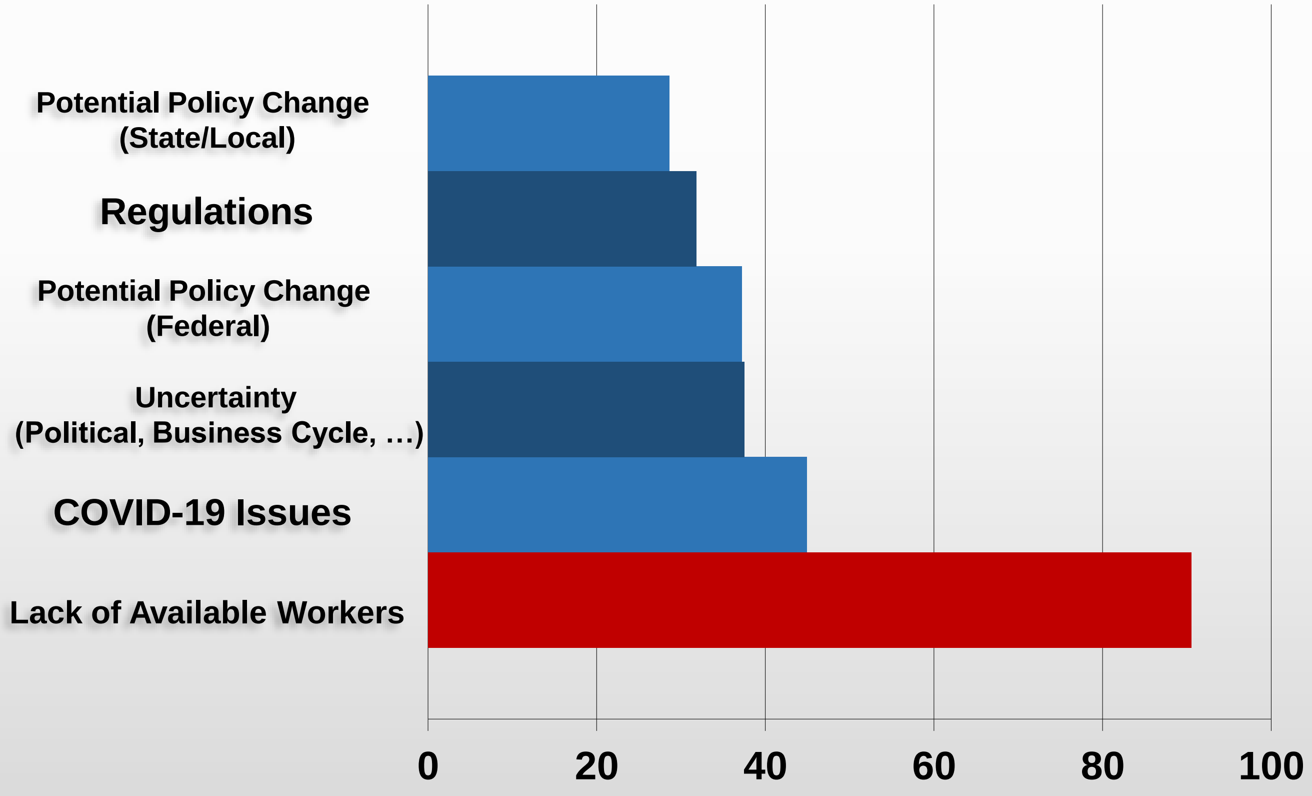
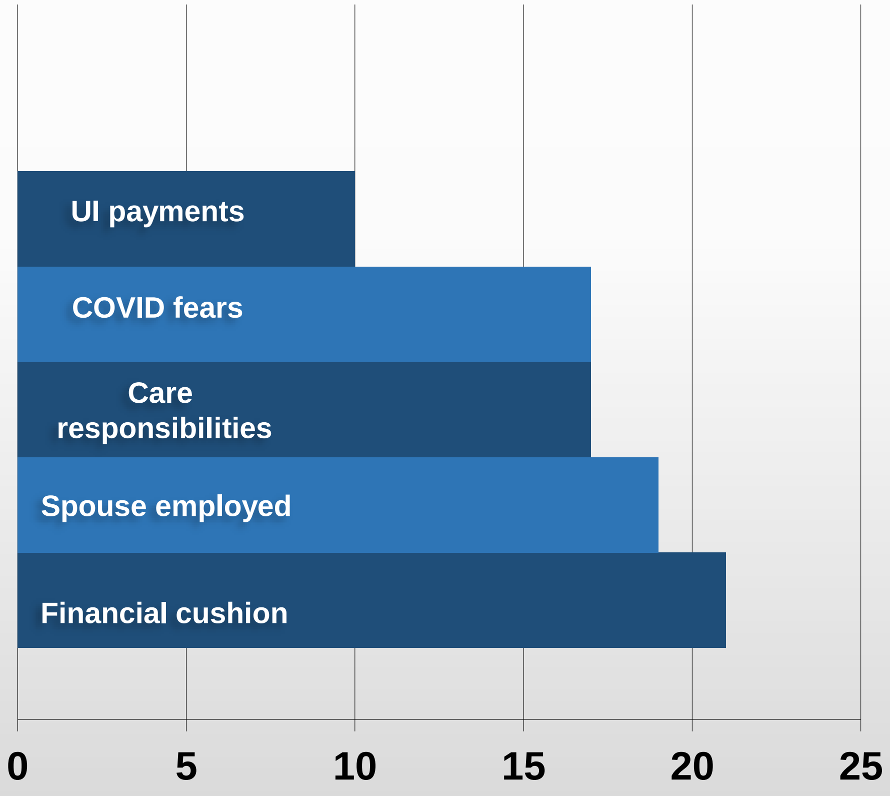
Labor Markets Remain Tight

Which of the following factors are slowing the economy in your area?



Source: US Chamber of Commerce

Reason behind non-urgent job search



Source: Indeed July 2021 Survey

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Labor Force Growth Restraints

Household Survey, Willing & Able to Work

Labor Force Recovery Hinderances
- Health concerns due to Covid
- Child care
- Heightened unemployment & Covid relief benefits

Labor Shortages Relief
- Covid fear subsides/vaccinations increase.
- Schools reopen
- Unemployment & covid relief benefits disappear.

Timing of Relief
- Improvement expected to begin to materialize in 4Q.

The longer the labor shortages persist, the more the cost/price increases become structural.

Labor Contract Negotiations

- In the context of tight labor market conditions, several major labor negotiations take place.

- Selected sample covering more than 1 million workers
    - Health care workers
    - Municipal workers
    - State & county workers
    - Long shoremen
    - USPS
    - Kaiser Permanente
    - School Bus First
    - Kroger

- 17 Cement plants face labor negotiations in 2022.

- This helps move “transitory” inflation into “structural” inflation.

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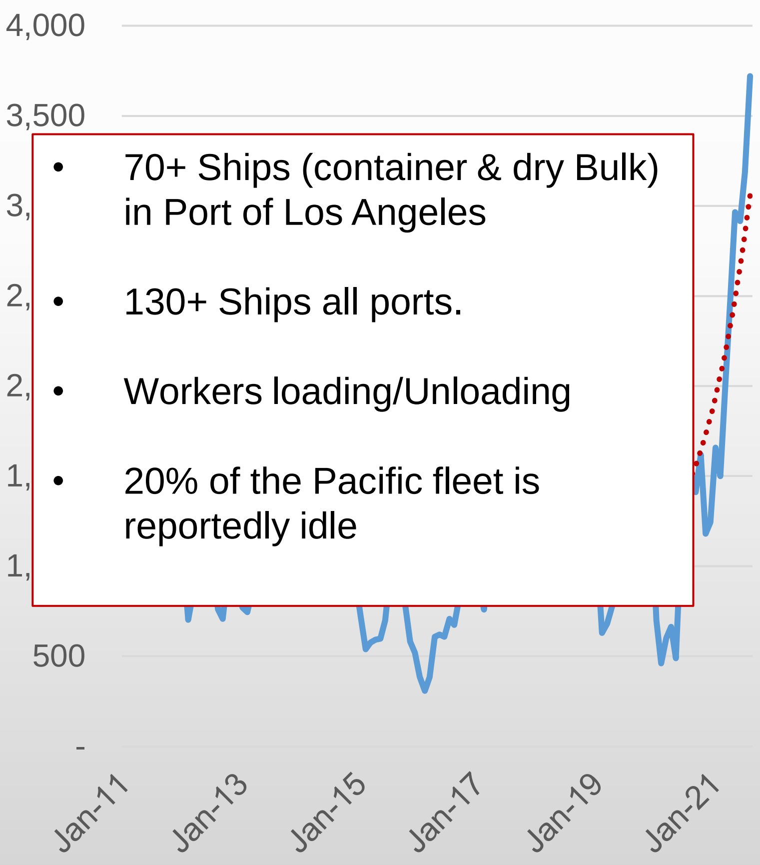
Logistics

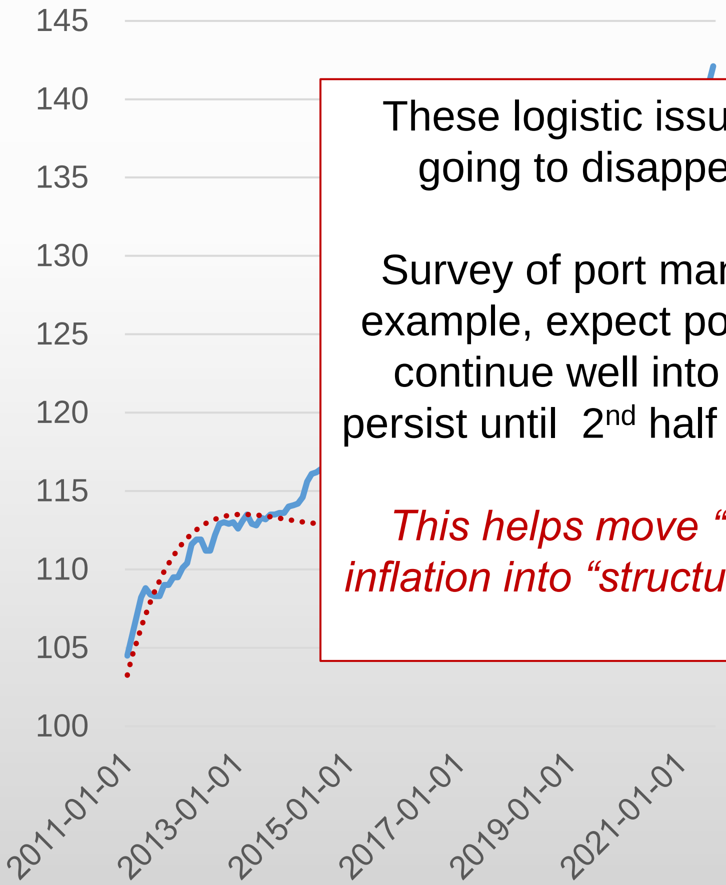
Logistics Issues

Baltic Dry Index
Proxy for Dry-Bulk Freight Rates



- 70+ Ships (container & dry Bulk) in Port of Los Angeles
- 130+ Ships all ports.
- Workers loading/Unloading
- 20% of the Pacific fleet is reportedly idle

Freight Trucking Index
Dec 2003=100



These logistic issues are not going to disappear soon.

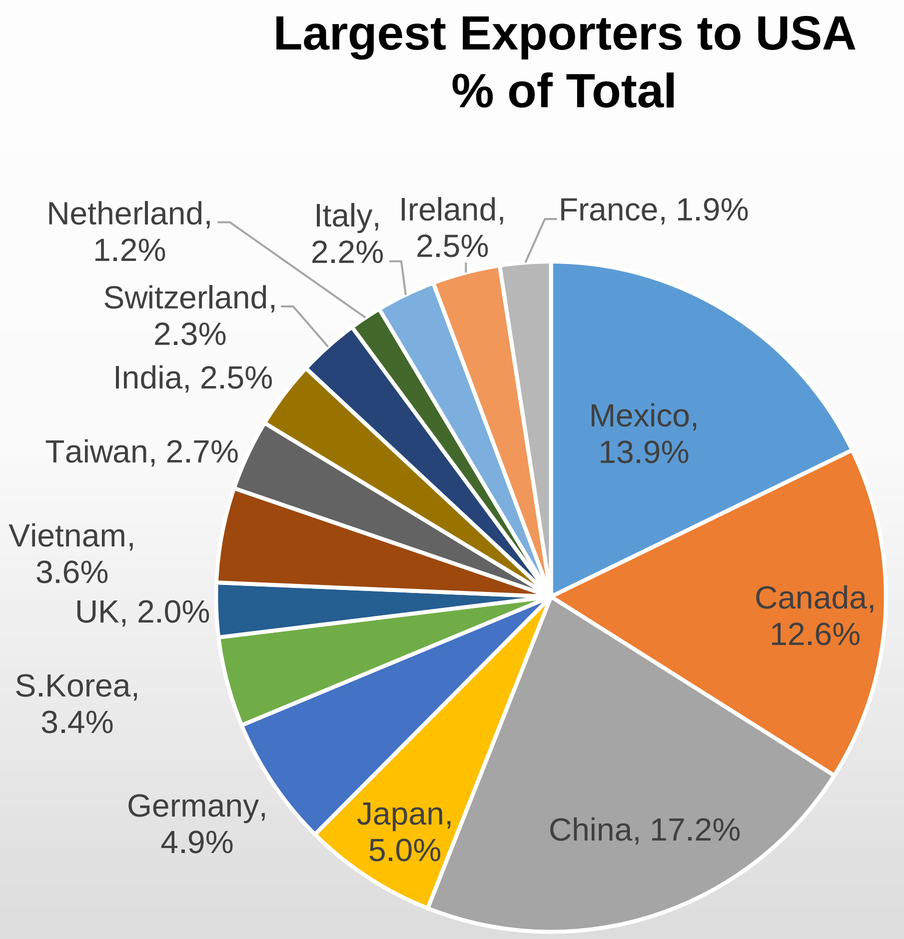
Survey of port managers, for example, expect port strains to continue well into 2022 and persist until 2nd half of next year.

This helps move "transitory" inflation into "structural" inflation.

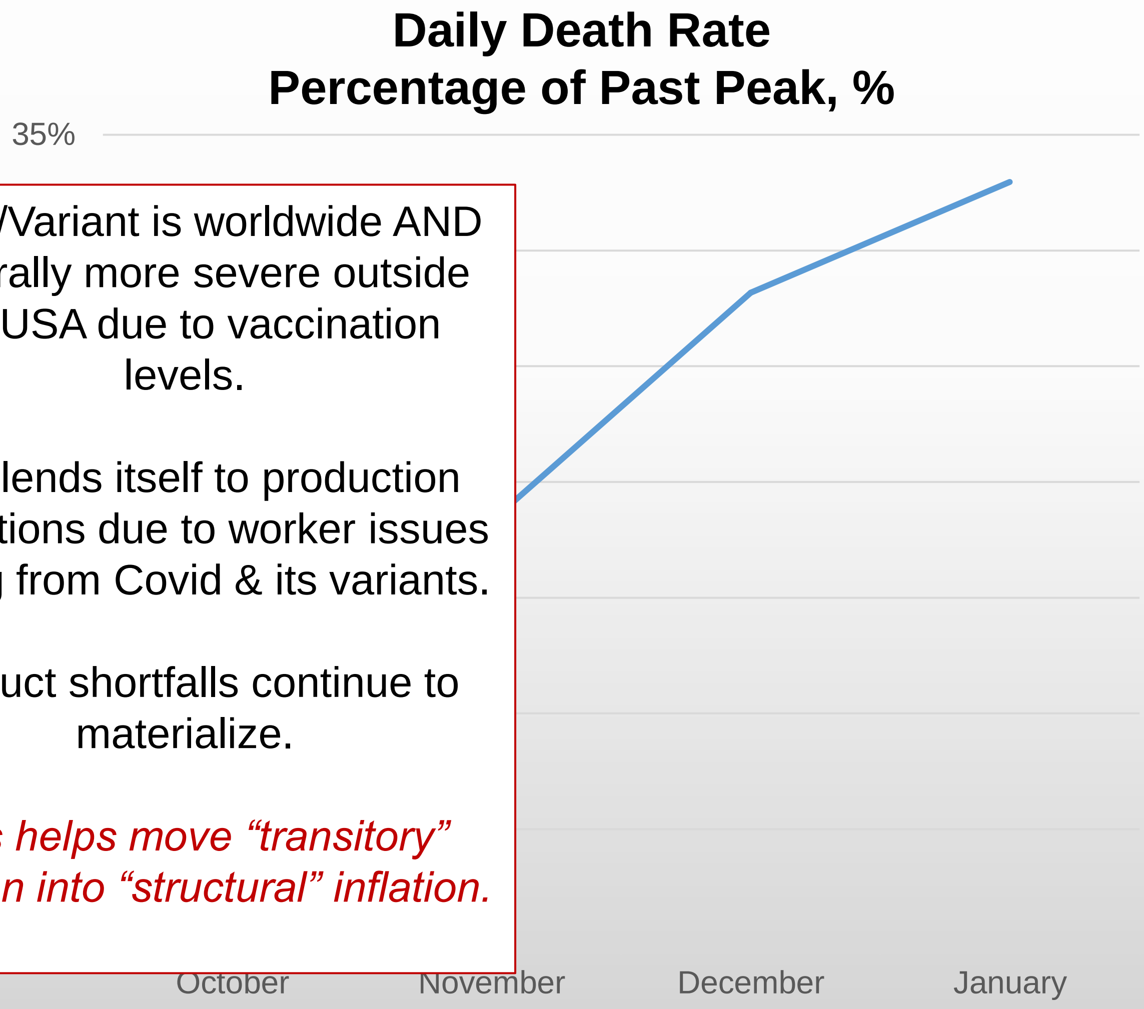
Freight Rail Index
Dec 2003=100

Product Markets

IHME Global Projections



Top 15 Exporters Account for 78% of Total US Imports



Covid/Variant is worldwide AND generally more severe outside the USA due to vaccination levels.

This lends itself to production disruptions due to worker issues arising from Covid & its variants.

Product shortfalls continue to materialize.

This helps move "transitory" inflation into "structural" inflation.

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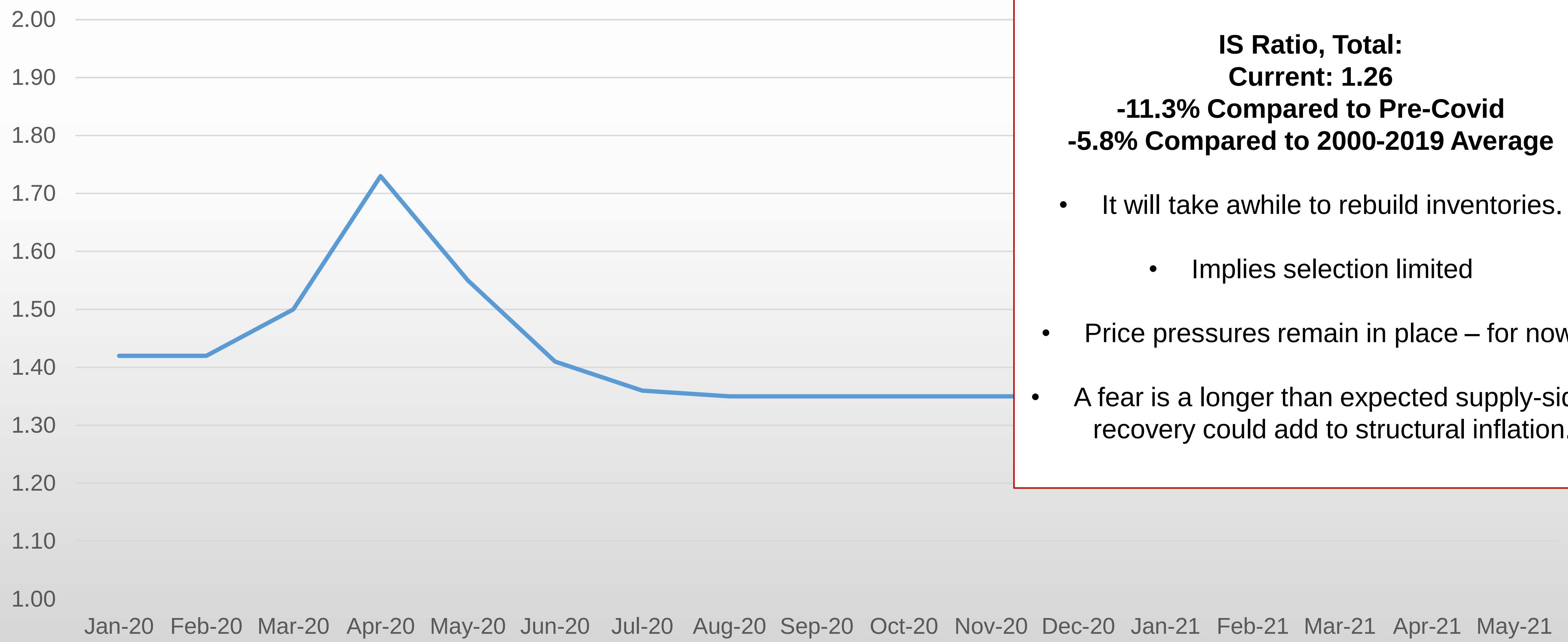
Inventories Remain Lean

Inventory-to-Sales Ratio



IS Ratio, Total:
Current: 1.26
-11.3% Compared to Pre-Covid
-5.8% Compared to 2000-2019 Average

- It will take awhile to rebuild inventories.
- Implies selection limited
- Price pressures remain in place – for now.
- A fear is a longer than expected supply-side recovery could add to structural inflation.

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Inflation Assessment & Federal Reserve Assumptions

How Much of Inflation Transitory ?

Pressure Gauge

Indicator		Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21
Time	ISM Manufacturing Supplier Deliveries	57.3	65.0	76.0	68.0	56.9	55.8	58.2	59.0	60.5	61.7	67.7	68.2	72.0	76.6	75.0	78.8	75.1	72.5	69.5
	ISM Services Supplier Deliveries	52.4	62.1	78.3	67.0	57.5	55.2	60.5	54.9	56.2	57.0	62.8	57.8	60.8	61.0	66.1	70.4	68.5	72.0	
	Ships at Anchor-LA & Long Beach (Mo. Avg.)	0.0	0.0	0.0	0.0	0.0	0.5	2.0	1.5	4.3	10.0	22.2	32.1	32.6	26.5	21.5	18.9	13.8	21.4	33.4
Volume	**Taiwan Electronic Product Exports** (YoY)	46.2%	18.1%	24.3%	13.2%	23.8%	15.6%	19.1%	26.1%	21.8%	19.5%	22.2%	47.5%	14.4%	24.5%	34.0%	29.6%	29.8%	33.6%	
	Cass Freight Index (YoY)	-7.5%	-9.2%	-22.7%	-23.6%	-17.8%	-13.1%	-7.6%	-1.8%	2.4%	2.7%	6.7%	8.6%	4.1%	10.0%	27.6%	35.3%	26.8%	15.6%	
	Unfilled Orders (3-Mo. Ann.)	7.6%	3.7%	0.9%	-2.2%	-0.3%	2.8%	4.0%	5.1%	6.2%	7.4%	6.7%	8.4%	10.8%	14.7%	15.1%	15.3%	13.1%	13.0%	
Price	**World Container Index (WCI)** (USD/40ft Box)	$1,633	$1,520	$1,500	$1,549	$1,788	$2,009	$2,144	$2,541	$2,592	$2,806	$3,955	$5,263	$5,227	$4,991	$4,919	$5,898	$7,052	$8,879	$9,556
	WCI: Shanghai-Los Angeles (USD/40ft Box)	$1,525	$1,433	$1,615	$1,718	$2,343	$2,923	$3,283	$3,934	$4,072	$4,047	$4,118	$4,186	$4,292	$4,234	$4,267	$5,453	$6,793	$9,797	$10,721
	PPI Transp. & Ware. of Goods (3-Mo. Ann.)	0.3%	-1.9%	-7.6%	-12.2%	-8.8%	1.0%	9.0%	8.0%	6.5%	7.8%	10.2%	10.7%	13.0%	16.3%	13.1%	20.7%	16.0%	16.0%	
	Dry Van Rate Per Mile (YoY of 4-Wk. Mov. Avg.)	-3.3%	-2.3%	4.1%	-3.6%	-4.5%	3.4%	20.2%	33.0%	41.3%	48.7%	48.1%	39.0%	36.5%	49.5%	51.4%	70.0%	69.2%	43.7%	28.6%
Inventory	**Inventory-to-Sales Ratio** (All Businesses)	1.42	1.50	1.73	1.55	1.41	1.36	1.35	1.35	1.35	1.35	1.35	1.30	1.33	1.26	1.25	1.26	1.25		
	ISM Manufacturing Inventories Index	46.5	46.9	49.7	50.4	50.5	47	44.4	47.1	51.6	50.8	51	50.8	49.7	50.8	46.5	50.8	51.1	48.9	54.2
	ISM Manufacturing Consumer Inventories	41.8	43.4	48.8	46.2	44.6	41.6	38.1	37.9	36.7	36.3	37.9	33.1	32.5	29.9	28.4	28.0	30.8	25.0	30.2
	Inventory Too Low (Net % of Firms)	-3.5%	-1.5%	-6.6%	-4.5%	1.2%	1.3%	2.7%	4.8%	4.4%	4.9%	6.5%	5.3%	4.5%	2.5%	7.0%	8.0%	11.0%	12.0%	
Labor	**Production & Manuf. Posts** (vs. Feb. 2020)	0.2%	1.3%	-30.0%	-31.6%	-23.7%	-13.8%	-6.1%	4.2%	12.9%	20.6%	27.4%	26.3%	38.2%	46.8%	63.5%	74.8%	76.7%	84.0%	78.0%
	Loading & Stocking Posts (vs. Feb. 2020)	1.4%	-0.4%	-32.5%	-32.7%	-17.6%	-0.8%	4.6%	12.3%	28.2%	38.8%	39.0%	26.3%	38.9%	46.4%	61.7%	72.7%	76.6%	90.2%	72.0%

Source: Institute for Supply Management (ISM), Bloomberg LP, Taiwan Ministry of Finance, U.S. Department of Labor, Drewry, U.S. Department of Commerce, National Federation of Independent Business (NFIB), Indeed.com and Wells Fargo Securities

PCA Has Increased its Near Term Inflation Outlook

- Previous Assessment: Suggests the heightening of inflation was temporary and not structural. That market forces will bring inflation back in line.
  - In this context, “transitory” generally defined as a one year or less.

- No Policy Action Required by the Fed

- Now: Inflation will likely be sticky downward due to the supply-side factors discussed. That means more of the inflation being experienced today is “structural”.

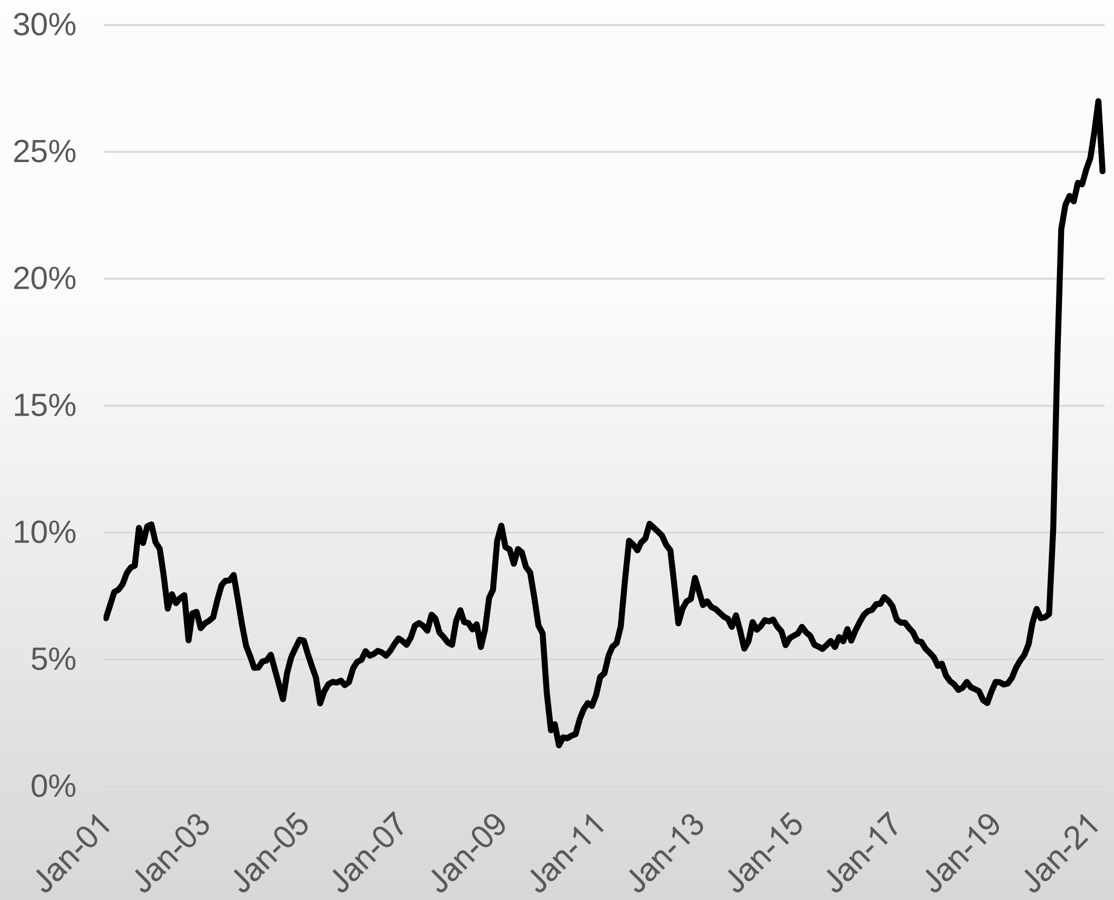
- *This implies more urgent & somewhat faster response by the Federal Reserve.*

- *Earlier Tapering & Rate Hikes.*

Monetary Policy

M2 Money Supply % Change

Annual Percent Change

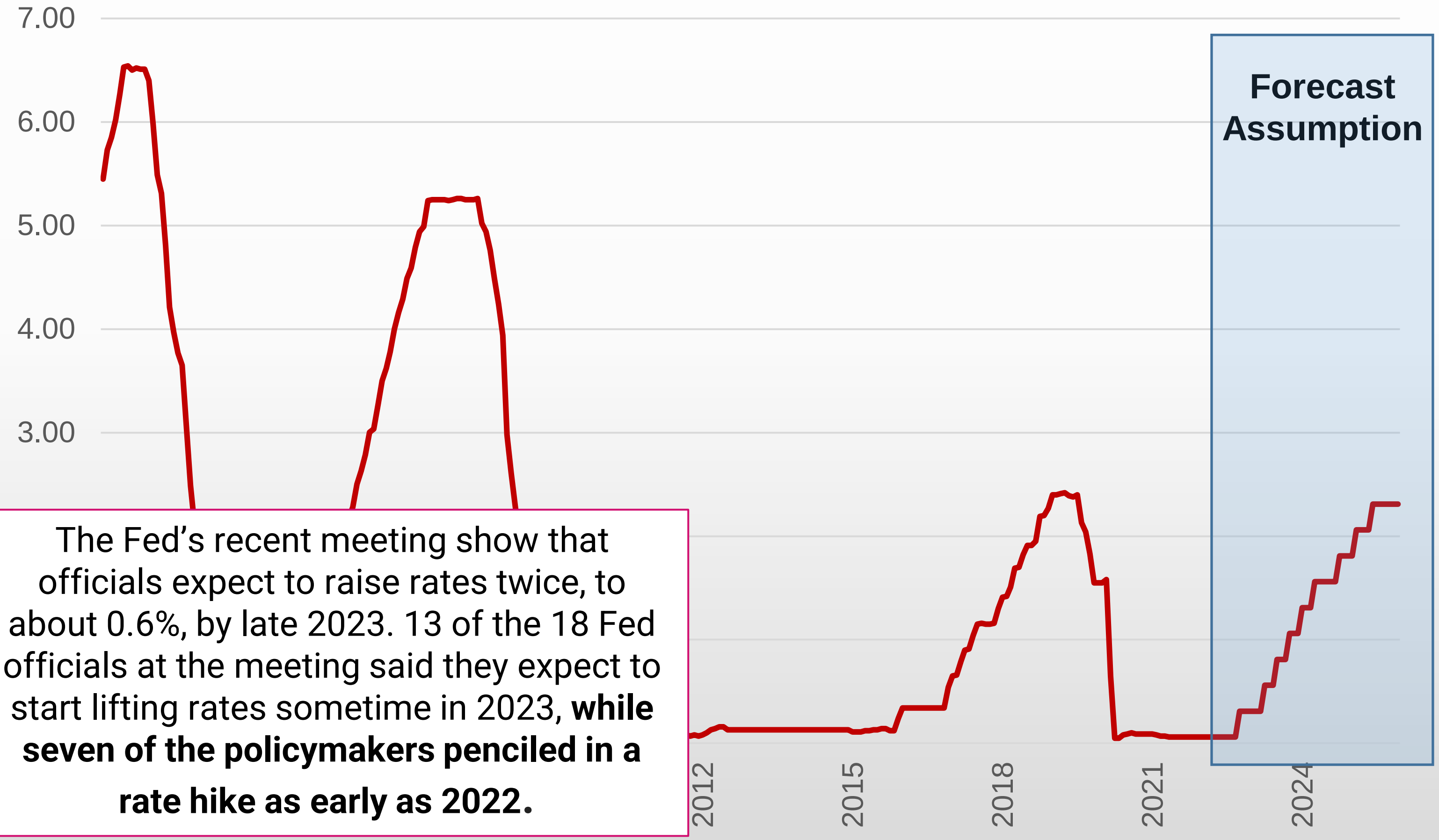


Monetary Policy: “Tapering”

- When Fed buys bonds, it adds liquidity to banking, and expands the money supply.
- The Fed has been buying of bonds, and increasing the Money Supply, in support of a fragile economy.
  - $120 Billion monthly, $8.3 trillion total.
- Fed “Tapering” means it will buy bonds at a slower rate. BUT – it is still buying.
- **Tapering expected to begin 4Q 2021**
- Tapering means the Money Supply will grow more slowly in the months ahead. But – it is still adding to growth in the Money Supply.
- In the initial stages “Tapering” supports growth – just at a lesser rate than before.
- Expansion of the Money Supply still adds to inflation – just at a lesser rate than before.

Monetary Policy: Rate Hikes

Fed Funds Rate



The Fed's recent meeting show that officials expect to raise rates twice, to about 0.6%, by late 2023. 13 of the 18 Fed officials at the meeting said they expect to start lifting rates sometime in 2023, **while seven of the policymakers penciled in a rate hike as early as 2022.**

Dual Mandate : Stable labor markets (low unemployment), stable prices (low inflation).

Likely error on side of employment – slow retreat from accommodative MP.

Federal Funds Rate: Fed begins rate hikes Q4 2022. Consistent with recently released Fed Survey (October 2022)

Rate increases are small. Assume 25 basis point increases.

Rate hikes: 1 = 2022, 4=2023, 4=2024, 2=2025

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Economy's Sensitivity to Rate Increases

- ***Gradual*** describes Federal Reserve approach toward monetary policy tightening.
  - Tapering
  - Federal Funds Rate (FF Rate)

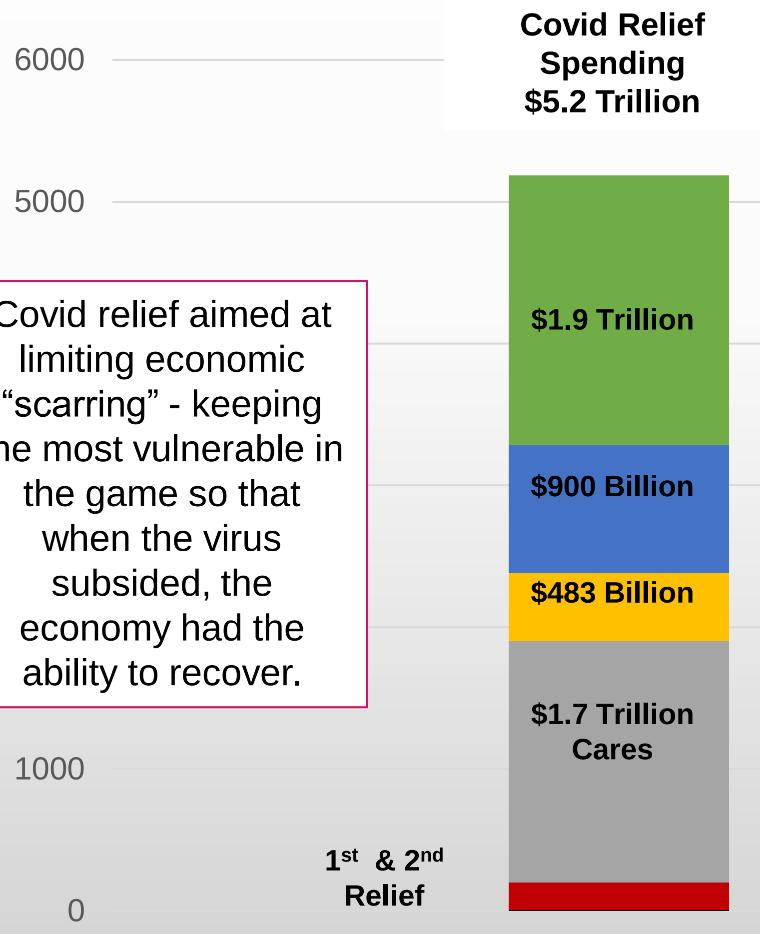
- ***Increases likely to be small & digestible***. FF Rate – 25 basis points at a time.

- Small, gradual rate increases ***built off historically low interest rate levels***.

- Business and consumer ***sensitivity to rate increases*** plays an important role on impact of economic and private construction growth.
  - Sensitivity is least with initial rate increases (2022) and as rates increase, sensitivity increases (2023-2025).

Fiscal Policy

Covid-19 Relief Spending



Covid relief aimed at limiting economic “scarring” - keeping the most vulnerable in the game so that when the virus subsided, the economy had the ability to recover.

It worked.

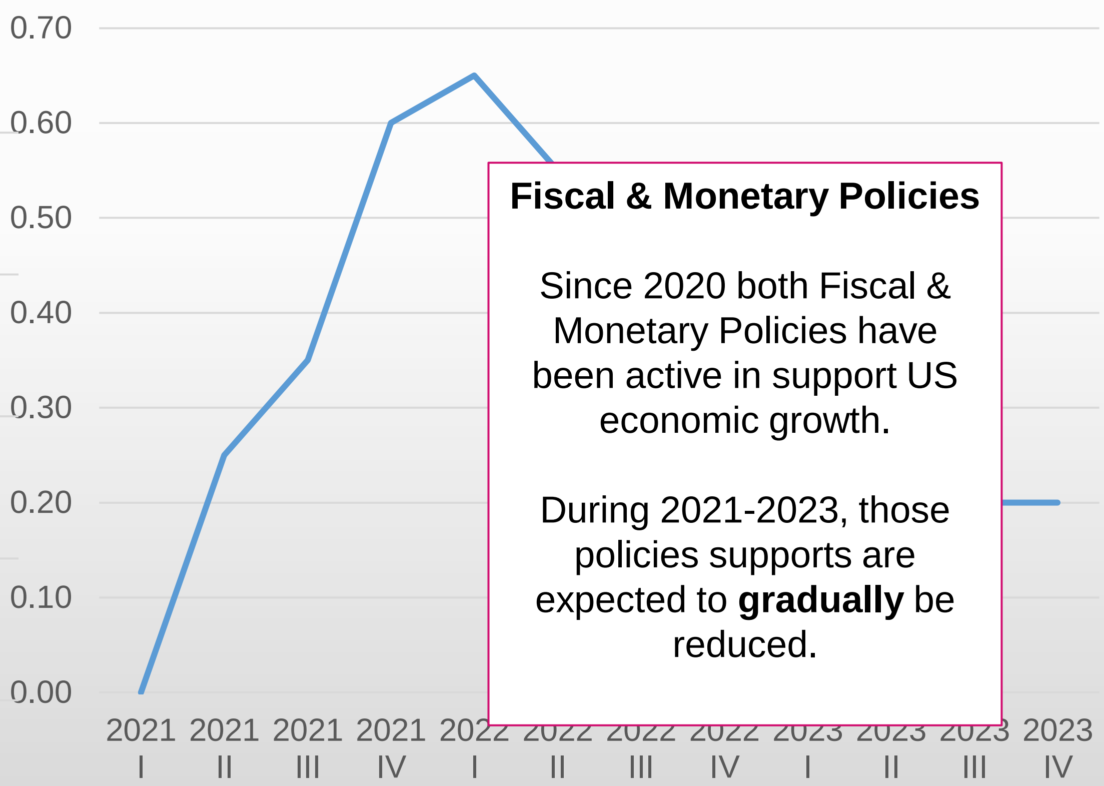
Consumers income well supported, debt declined.

Business support limited foreclosures & bankruptcies

Banks stress limited and remain strong.

Stimulative Impact of $1.9 Trillion Covid Relief Program

- Basis Point Impact on GDP Growth Rate



Fiscal & Monetary Policies

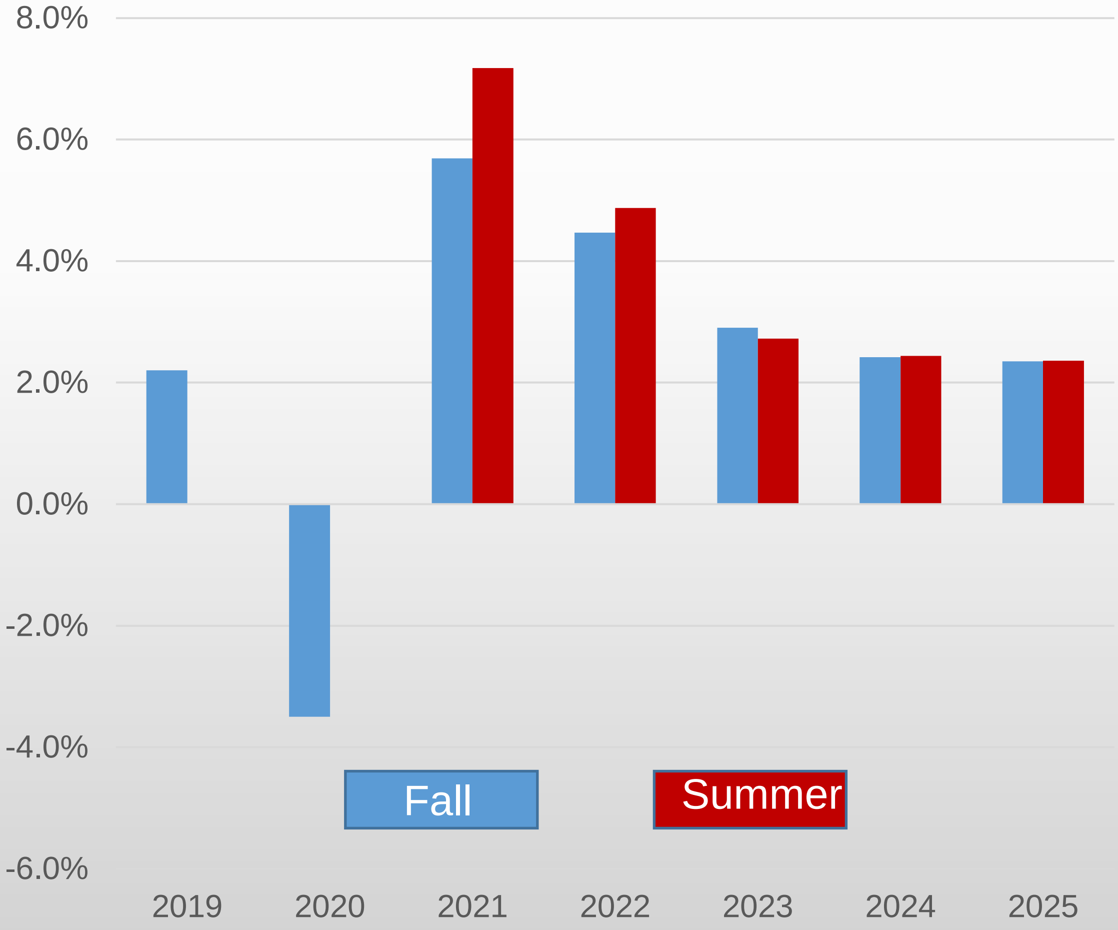
Since 2020 both Fiscal & Monetary Policies have been active in support US economic growth.

During 2021-2023, those policies supports are expected to **gradually** be reduced.

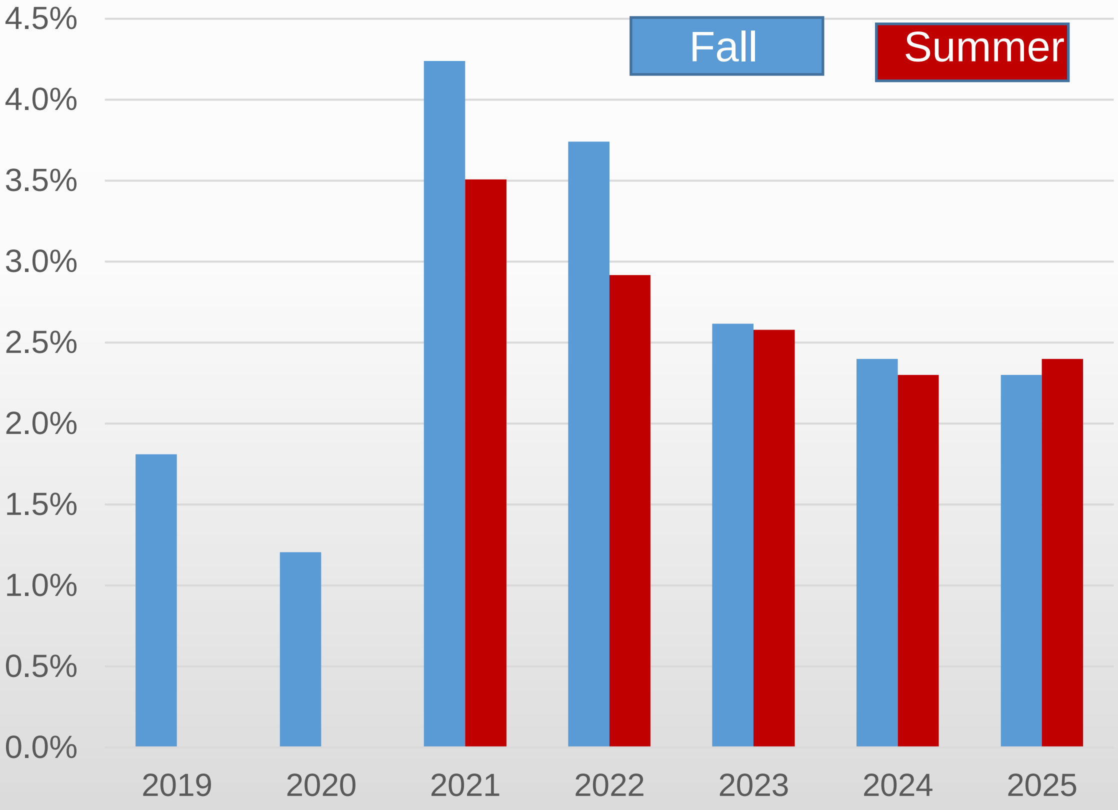
Economic Setting

Economic Performance

Real GDP Growth
Annual Rate



Inflation Outlook
Annual Rate

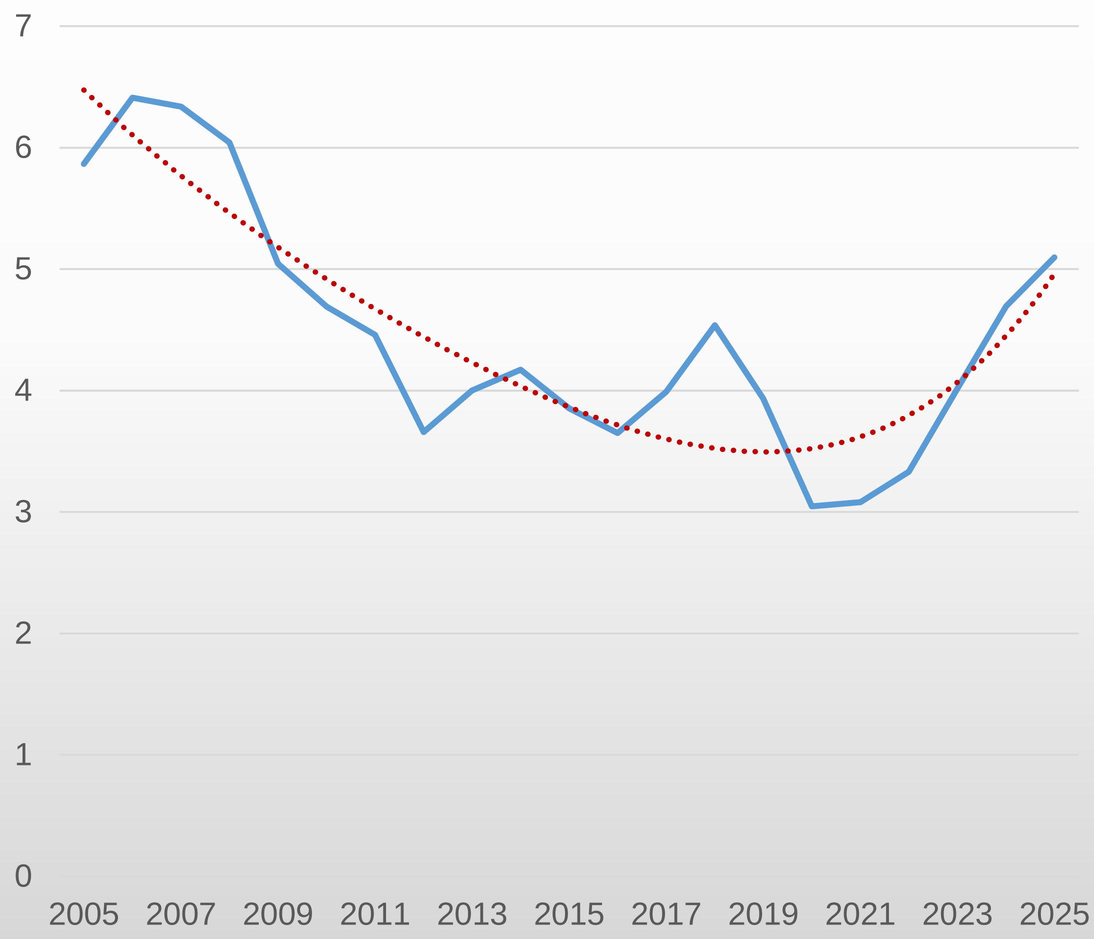


Construction Sector Assessments

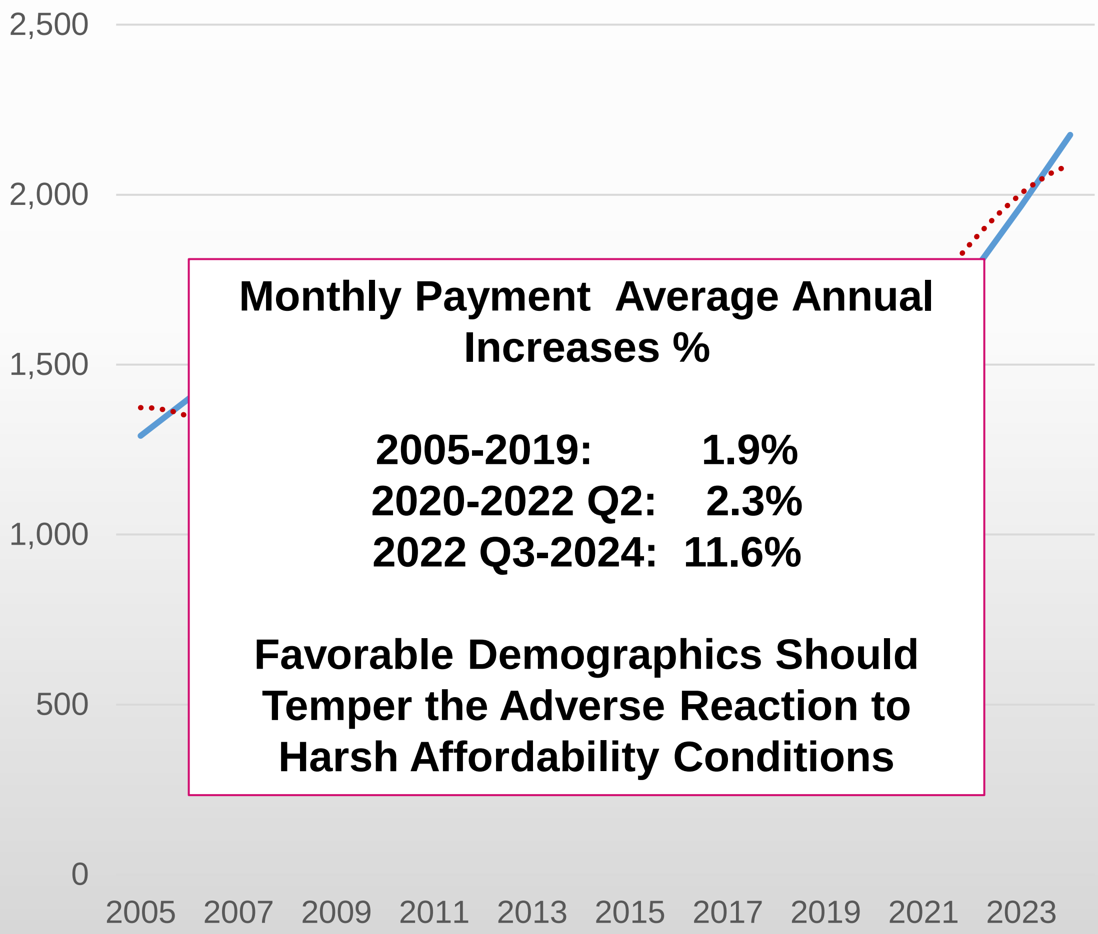
Residential

Residential Cement Consumption

Mortgage Interest Rates
Conventional, 30 Year, %



Average SF Monthly Payment



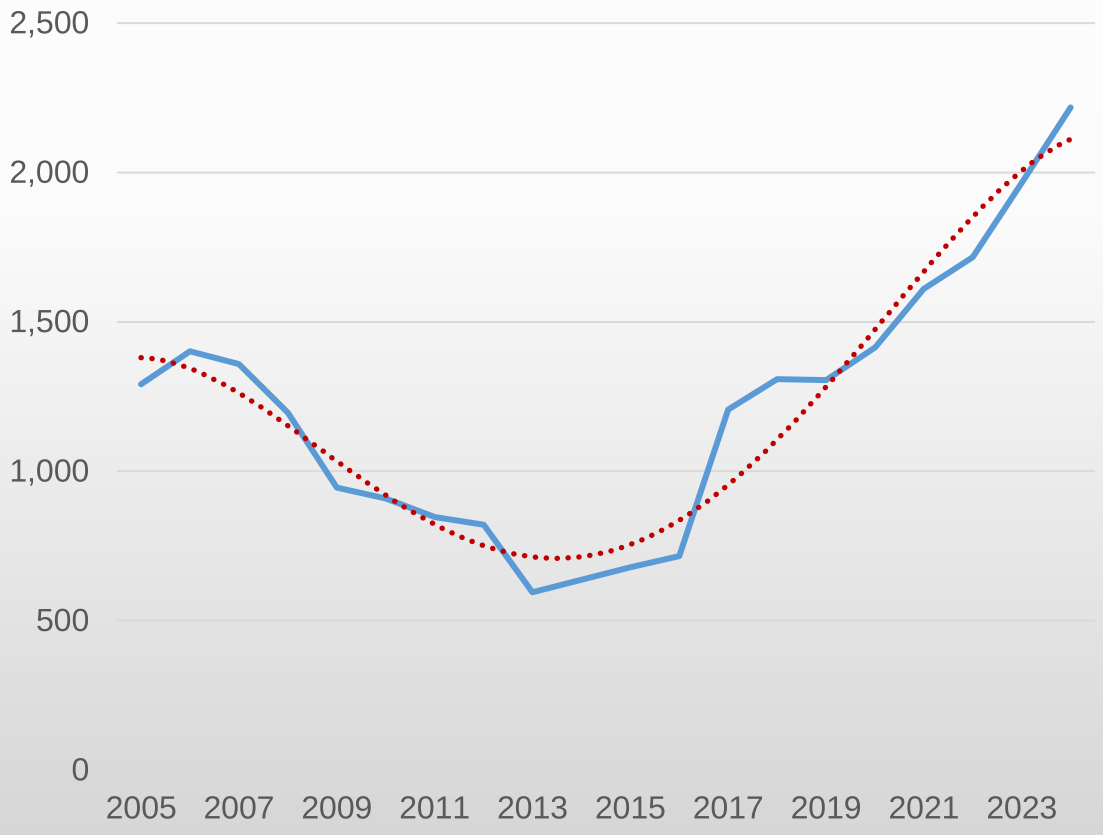
Monthly Payment Average Annual Increases %

2005-2019: 1.9%
2020-2022 Q2: 2.3%
2022 Q3-2024: 11.6%

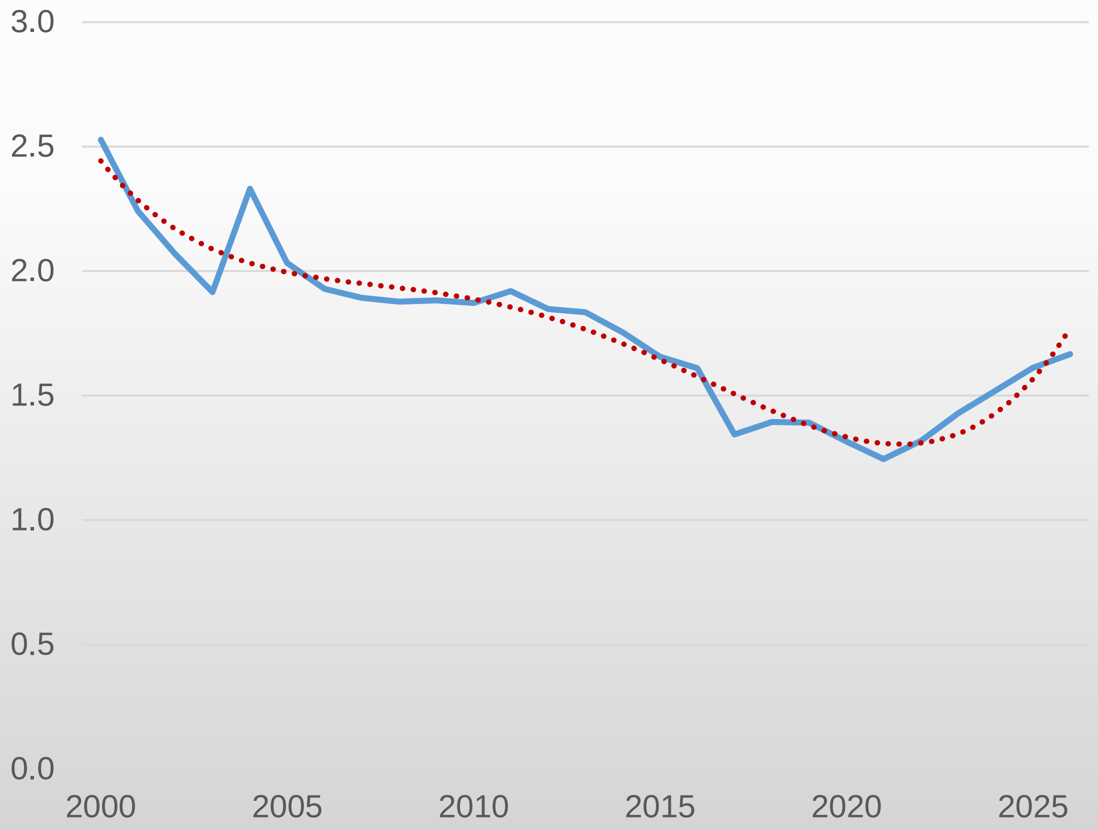
Favorable Demographics Should Temper the Adverse Reaction to Harsh Affordability Conditions

Residential Cement Consumption

Average SF Monthly Payment

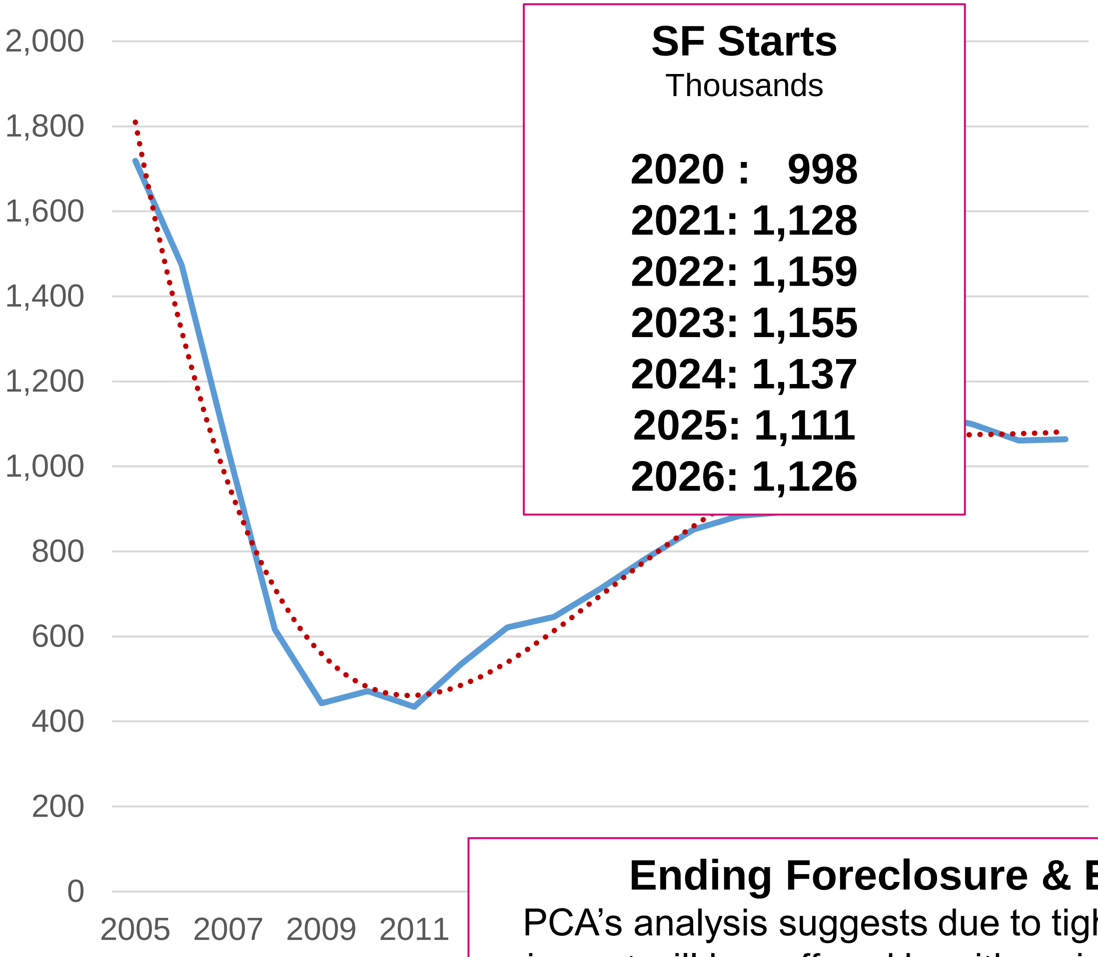


Mortgage to Rent Ratio



Housing Starts Outlook

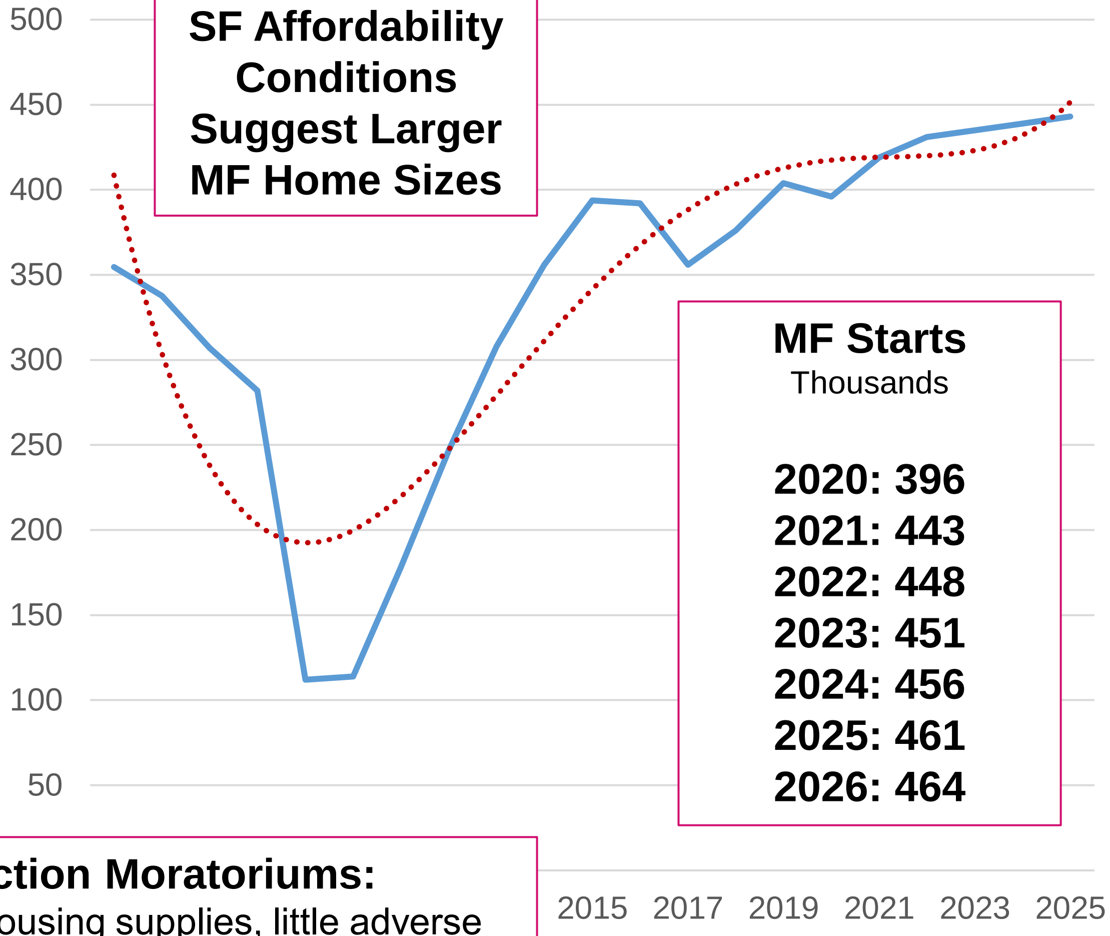
SF Starts
Thousands



SF Starts
Thousands

2020 : 998
2021: 1,128
2022: 1,159
2023: 1,155
2024: 1,137
2025: 1,111
2026: 1,126

MF Starts
Thousands



SF Affordability Conditions Suggest Larger MF Home Sizes

MF Starts
Thousands

2020: 396
2021: 443
2022: 448
2023: 451
2024: 456
2025: 461
2026: 464

Ending Foreclosure & Eviction Moratoriums:
PCA's analysis suggests due to tight housing supplies, little adverse impact will be suffered by either single and multifamily construction.

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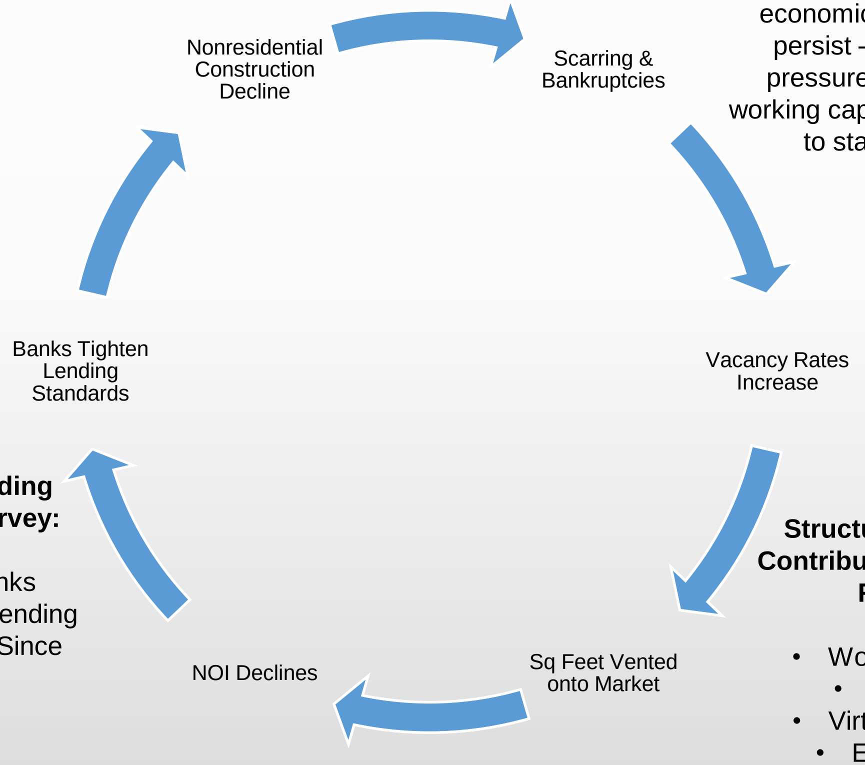
Nonresidential Projection

Nonresidential Recovery Process



Working Capital Factor:

The longer below “normal” economic conditions persist – the more pressure occurs on working capital and ability to stay open.

Bank Lending Officer Survey:

More Banks Tightening Lending Standards Since 2008

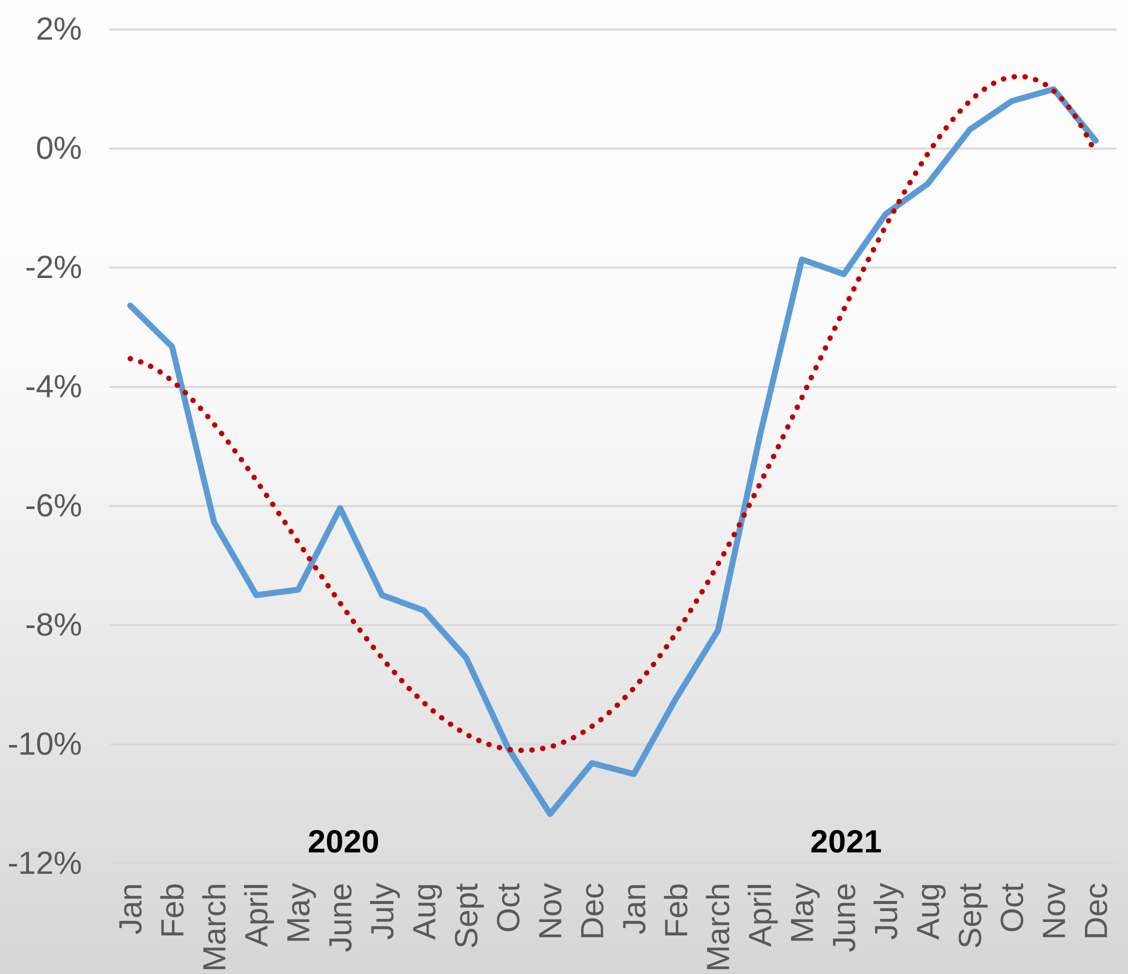
Structural Factors Contribute to Vacancy Rates:

- Work-At-Home
- E-Retail
- Virtual Meeting
- E-Learning
- Urban Trend Slows

1.5-2.5 MMT annual reduction

Nonresidential Construction

Real PIP, Y-O-Y Change



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Public Projection

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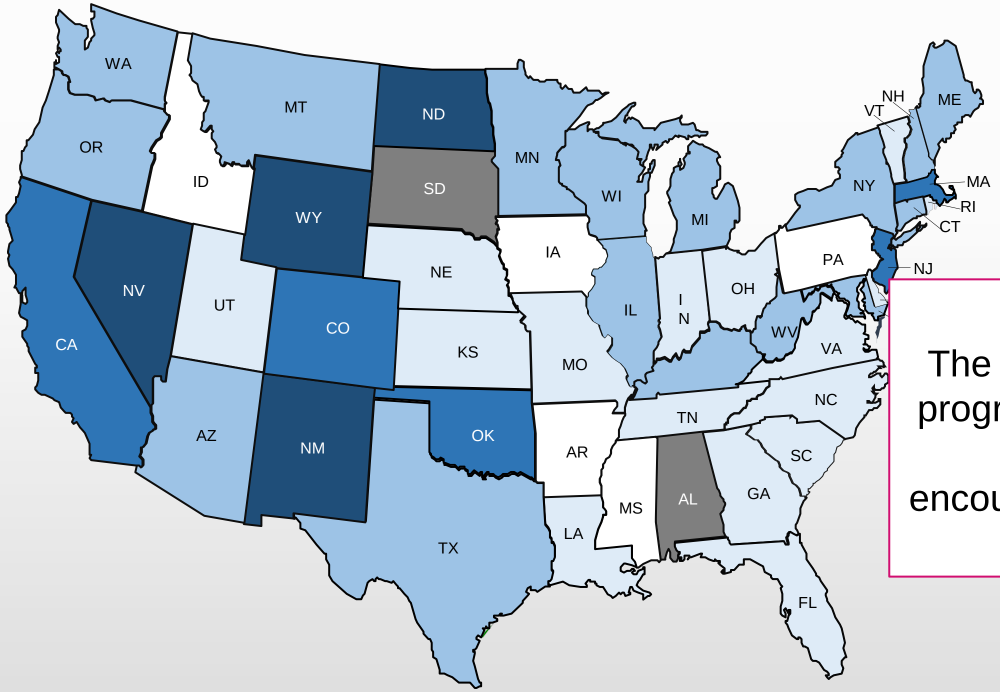
Evolving State Fiscal Conditions

State Funding – FY2021

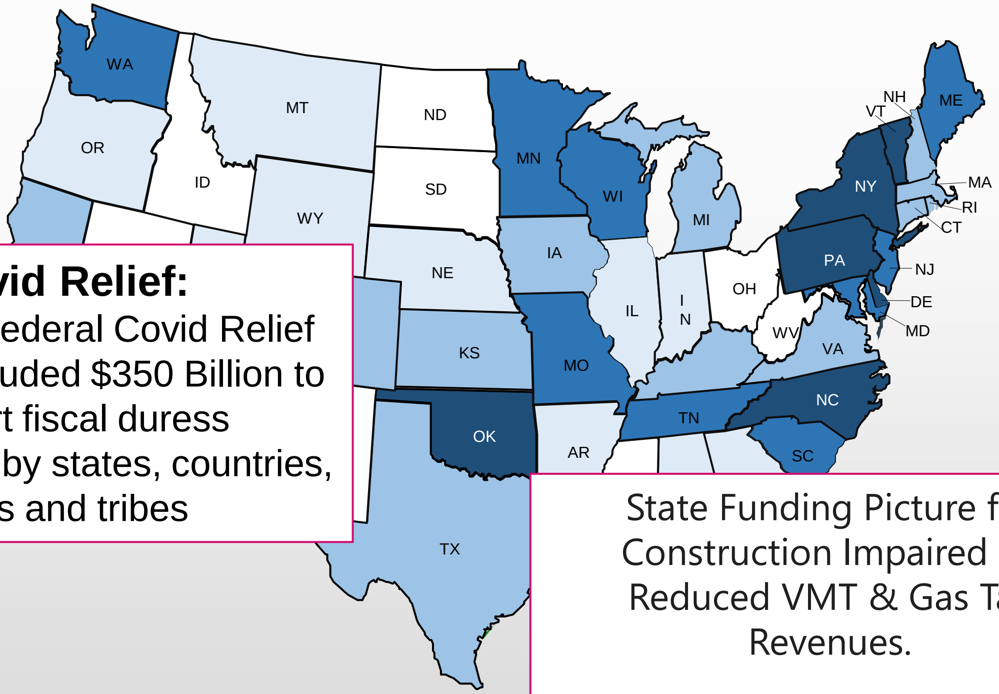
Percent Declines in General Fund Tax Revenues from Pre-COVID Levels



No Data | 21% to 26% | 16% to 20% | 11% to 15% | 6% to 10% | 1% to 5%

State Funding – FY2022

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



+10 % | 6% to 9.9% | 3% to 5.9%

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

State Funding Picture for Construction Impaired by Reduced VMT & Gas Tax Revenues.

May represent a longer term drag if work from home practices & EV useage become embedded.

If That is Where the Story Ends: No Infrastructure

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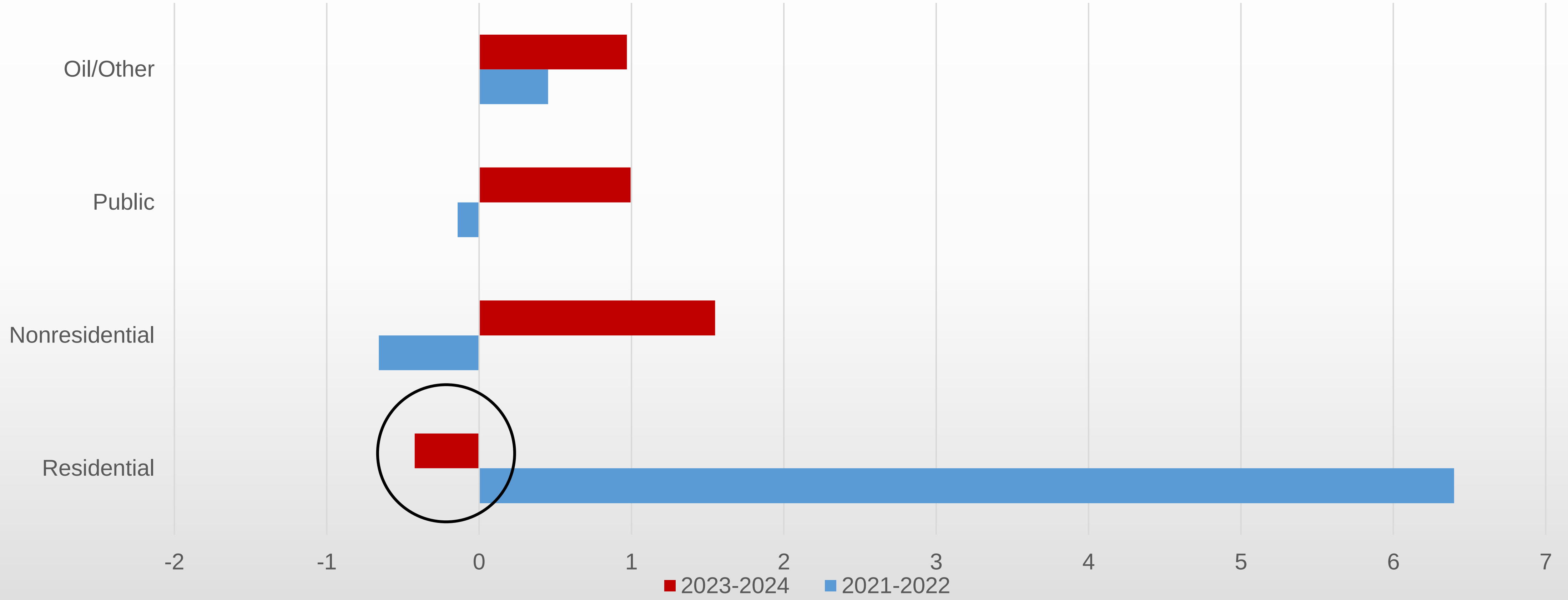
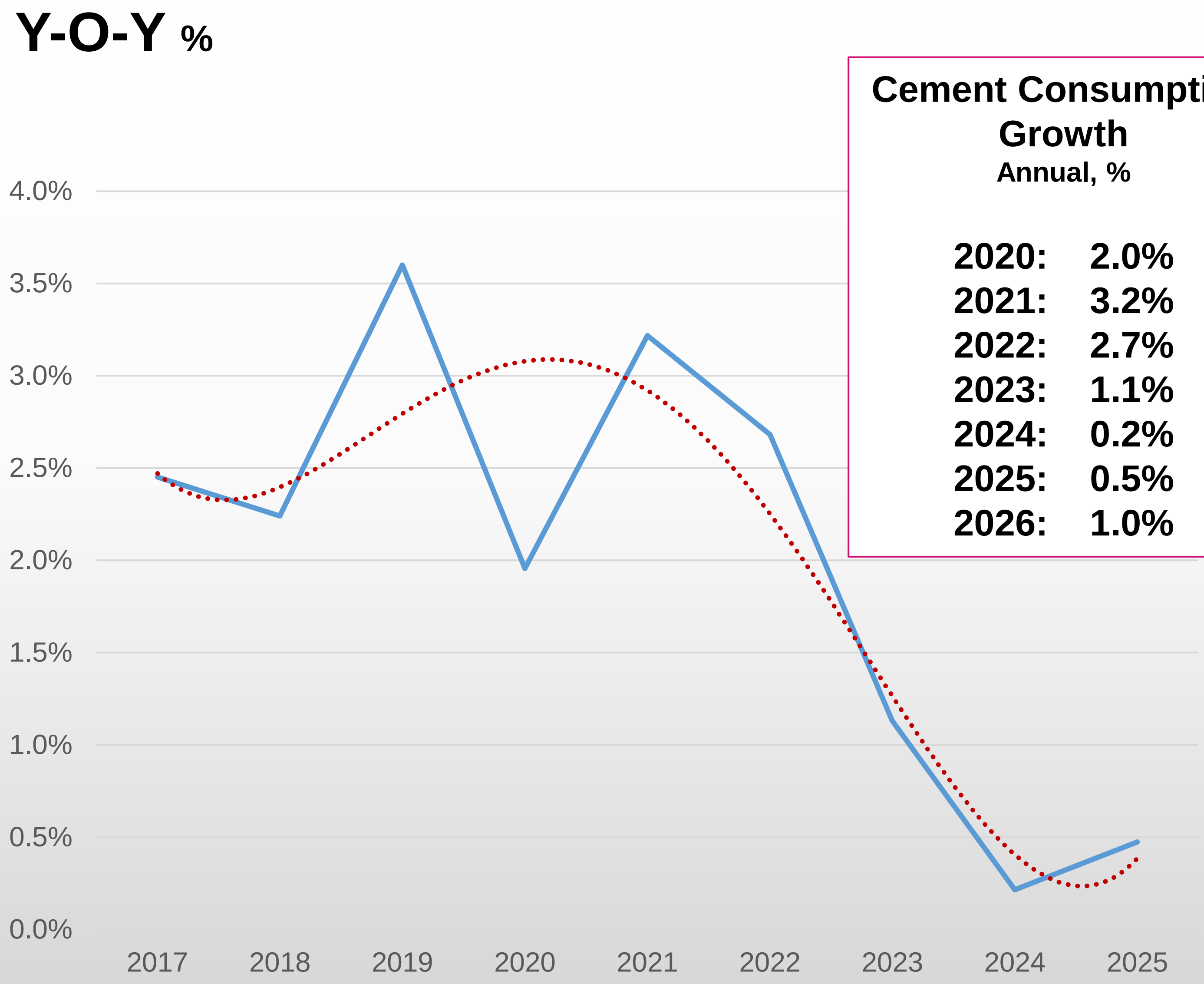
Composition of Growth



Cement Consumption Outlook: No Added Infrastructure



Cement Consumption Growth
Annual, %

2020:	**2.0%**
2021:	**3.2%**
2022:	**2.7%**
2023:	**1.1%**
2024:	**0.2%**
2025:	**0.5%**
2026:	**1.0%**

Late Years of Horizon

- Interest rates increase.
- Private sector slows.
- Public sector growth largely a state phenomenon and supported by moderately growing economic conditions.

Growth slows to 1% or Less in out years of forecast horizon

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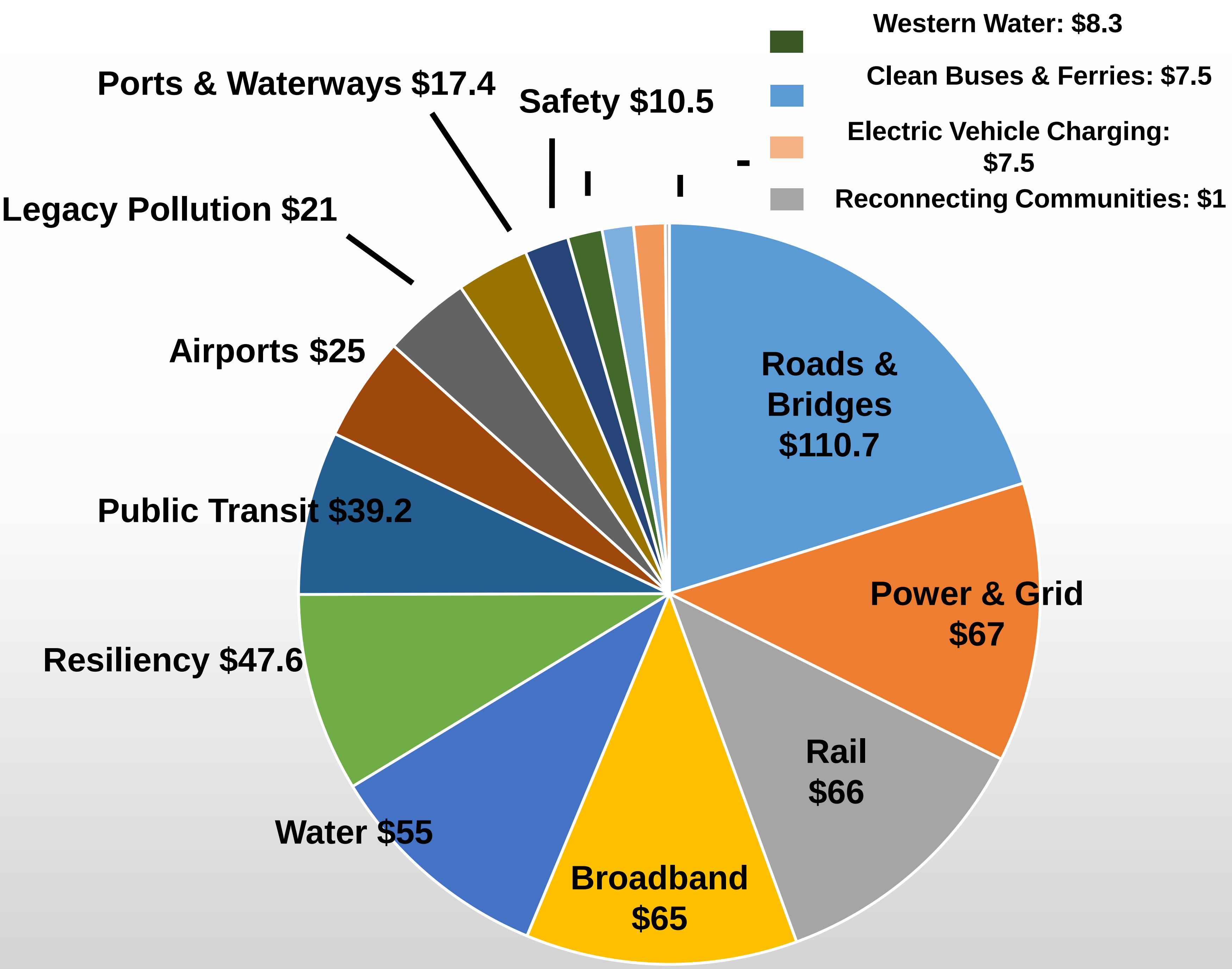
Infrastructure Assumption

Spending by Construction Segment

$1.2 Trillion
$ 550 Billion New



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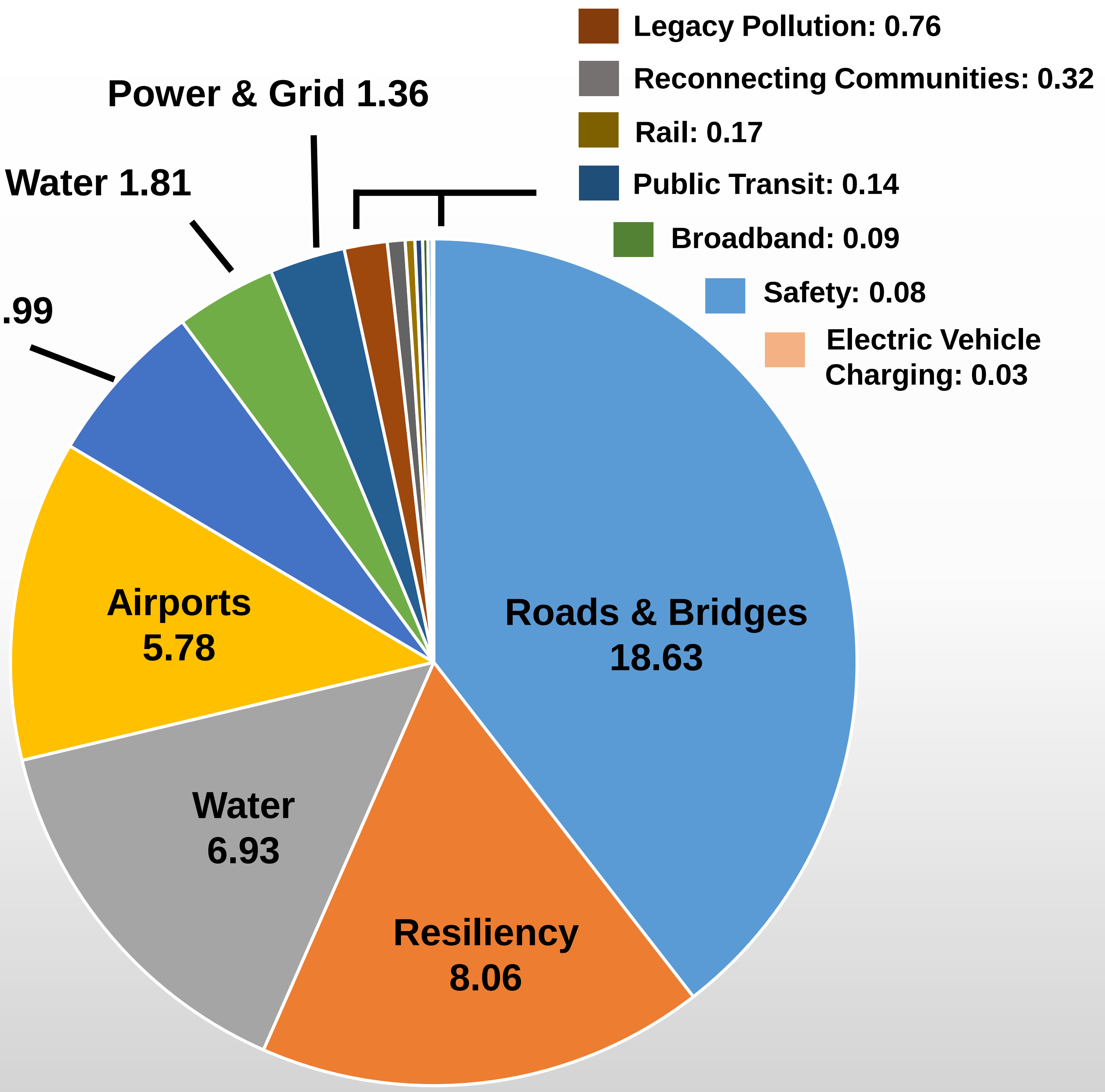
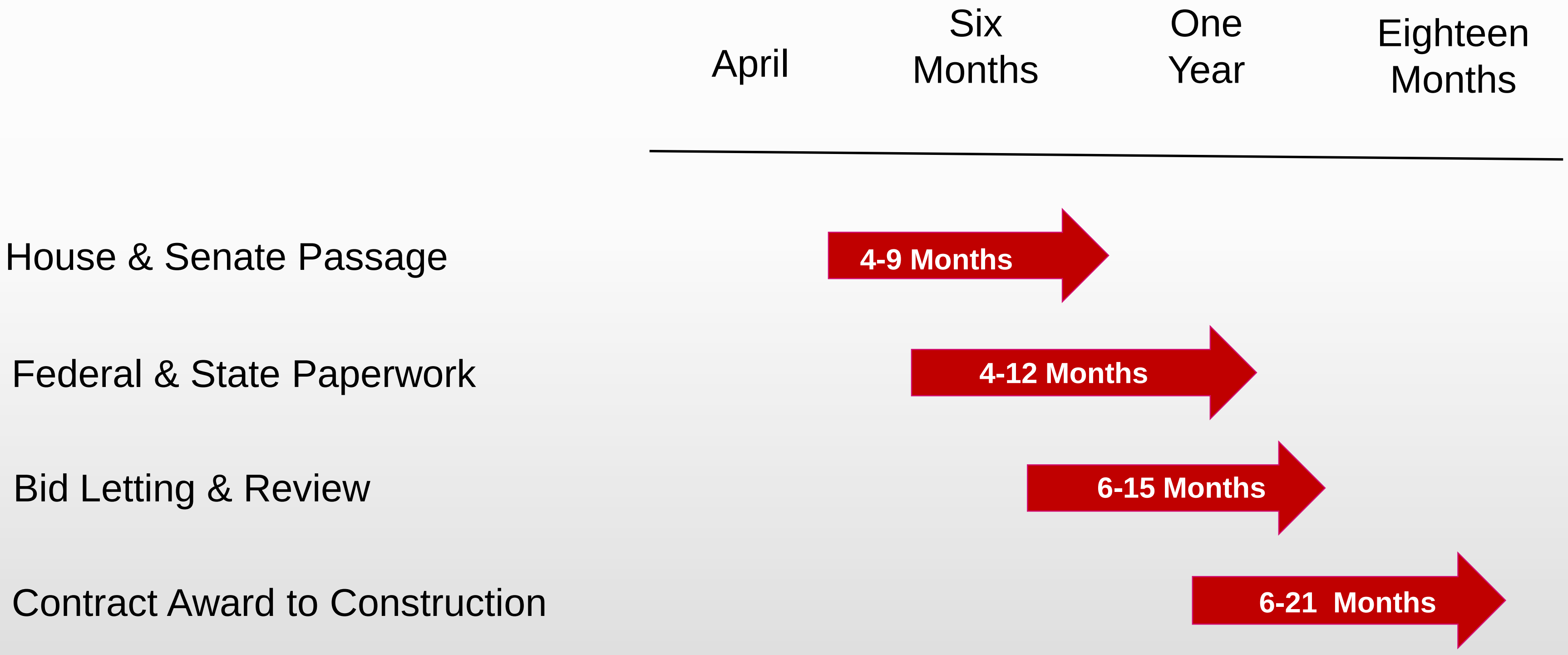
Cement Consumption by Construction Sector

46 Million Metric Tons Over Five Year Program



After Congressional Passage: There Will Be a Wait for Pouring to Begin



Average Construction Start: **Mid-2023**

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Infrastructure Timing Distribution
Highway & Bridges

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

	Spending Allocation Billion $	2023 Year 1	2024 Year 2	2025 Year 3	2026 Year 4	Total Spent	Total Spent
		Fiscal Year Spending					
2023	$14	$3	$6	$3	$2	$14	100%
2024	$14		$3	$6	$3	$12	86%
2025	$14			$3	$6	$9	64%
2026	$14				$3	$3	21%
Total Spending	$70	$3	$9	$12	$14		

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S&L Sterilization

Percentage Foregone

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

Utilities	Public Misc.	Conservation Public Buildings	Highway Bridges Water	Shovel Ready
0%	10%	15%	20%	33%

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Infrastructure Macroeconomic Impact on GDP
Billions of $

	2022	2023	2024	2025	2026
2022	X	X	X	X	X
2023	X	50	50	50	50
2024	X	X	50	50	50
2025	X	X	X	50	50
2026	X	X	X	X	50
Total	X	50	100	150	200
GDP Growth	X	+8BP	+13BP	+17BP	+25 BP
Cement Consumption	X	65,000 MT	130,000	195,000	260,000

- $1.2 Trillion Infrastructure Program Financed for 5 Years, or $240 Billion Annually.
- State & Local sterilization assumed to equal 20%.
- Annual allocations ($240 billion) spread over four years.
- Equates to roughly $50 Billion per allocation year ($48 Billion).

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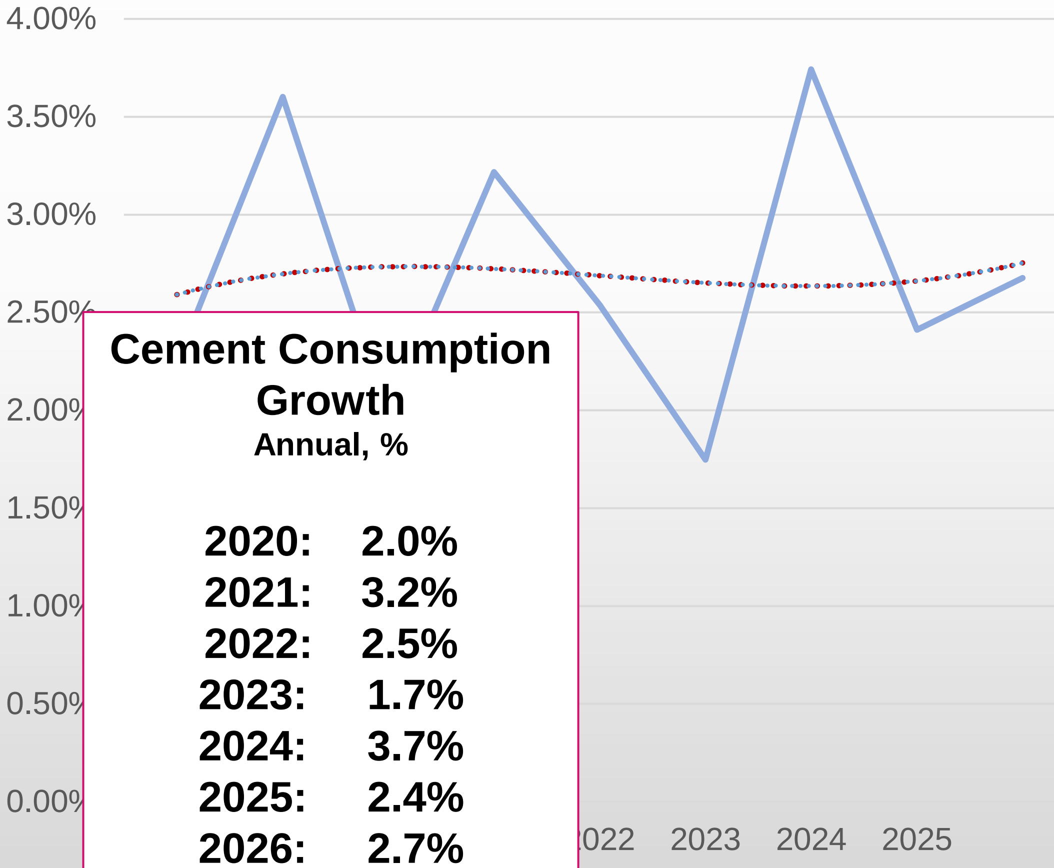
Cement Outlook Summary

Baseline Summary: With Infrastructure

Cement Consumption Growth

Y-O-Y % Change



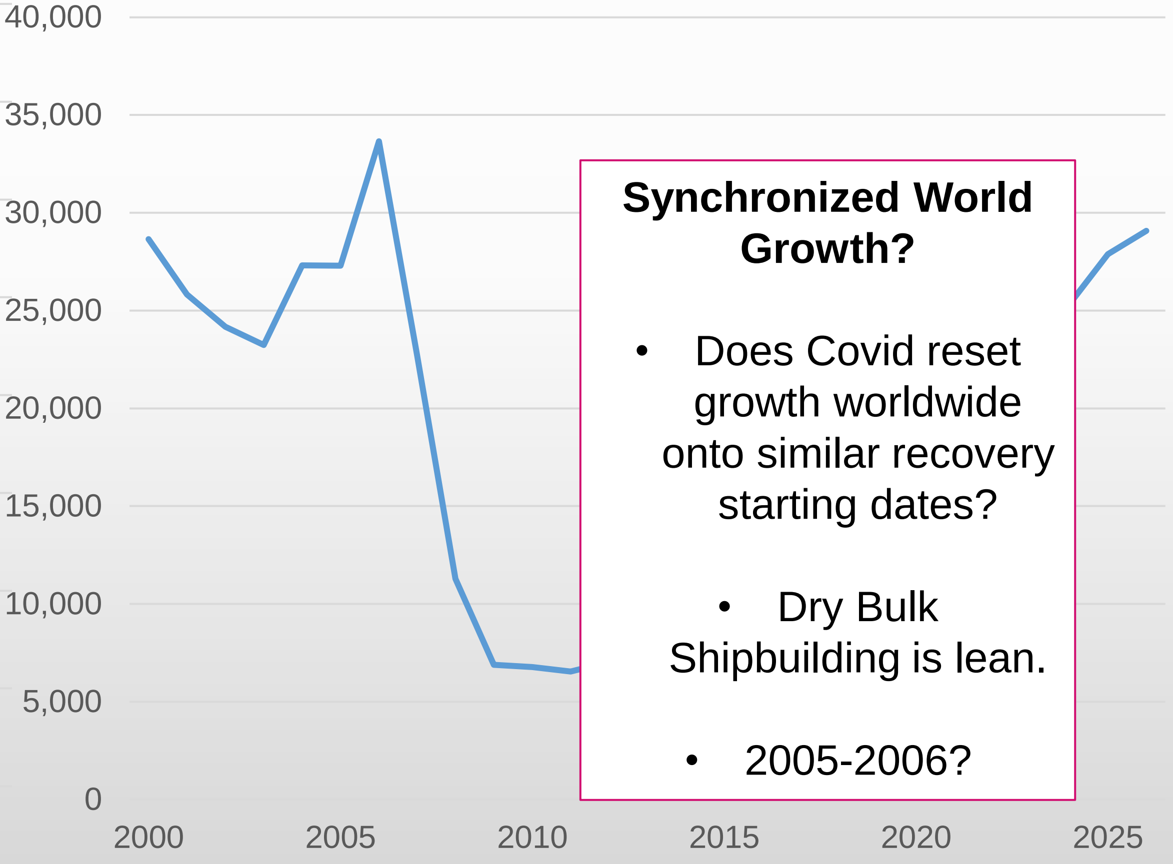
Cement Consumption Growth

Annual, %

2020: 2.0%
2021: 3.2%
2022: 2.5%
2023: 1.7%
2024: 3.7%
2025: 2.4%
2026: 2.7%

Cement Imports

Thousand Metric Tons

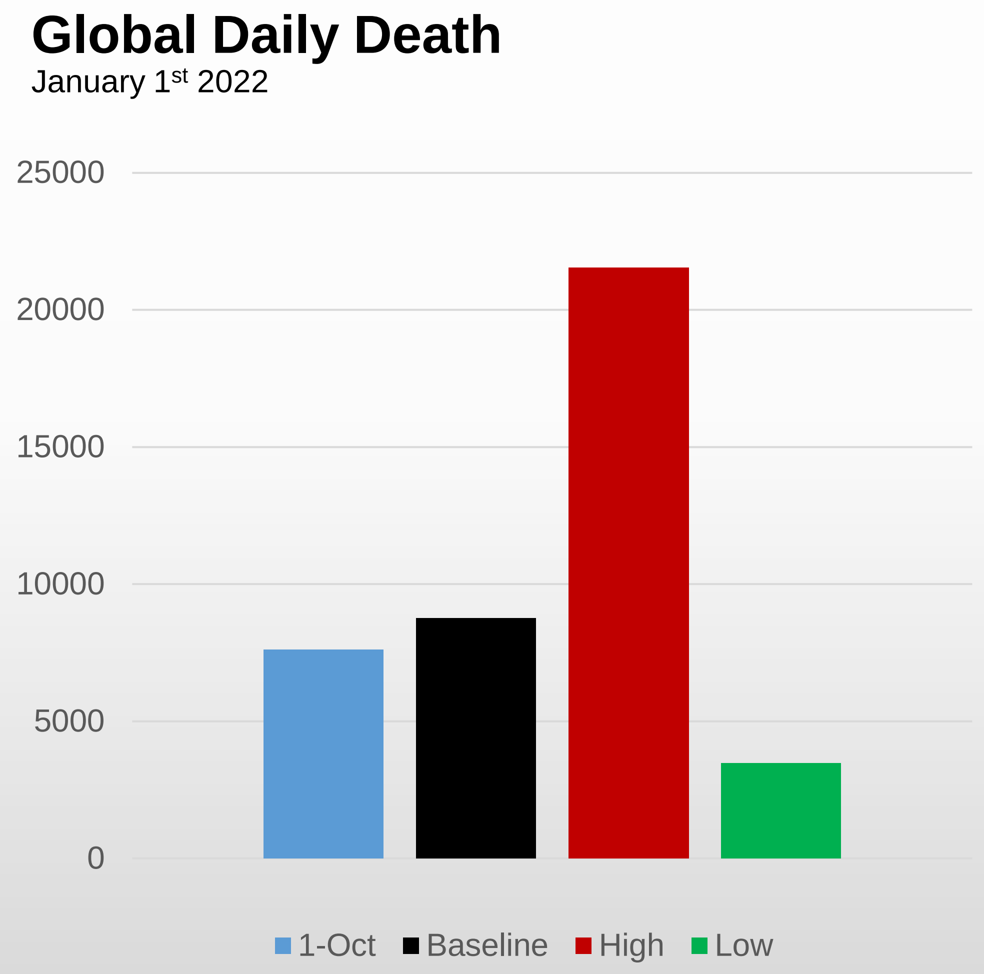


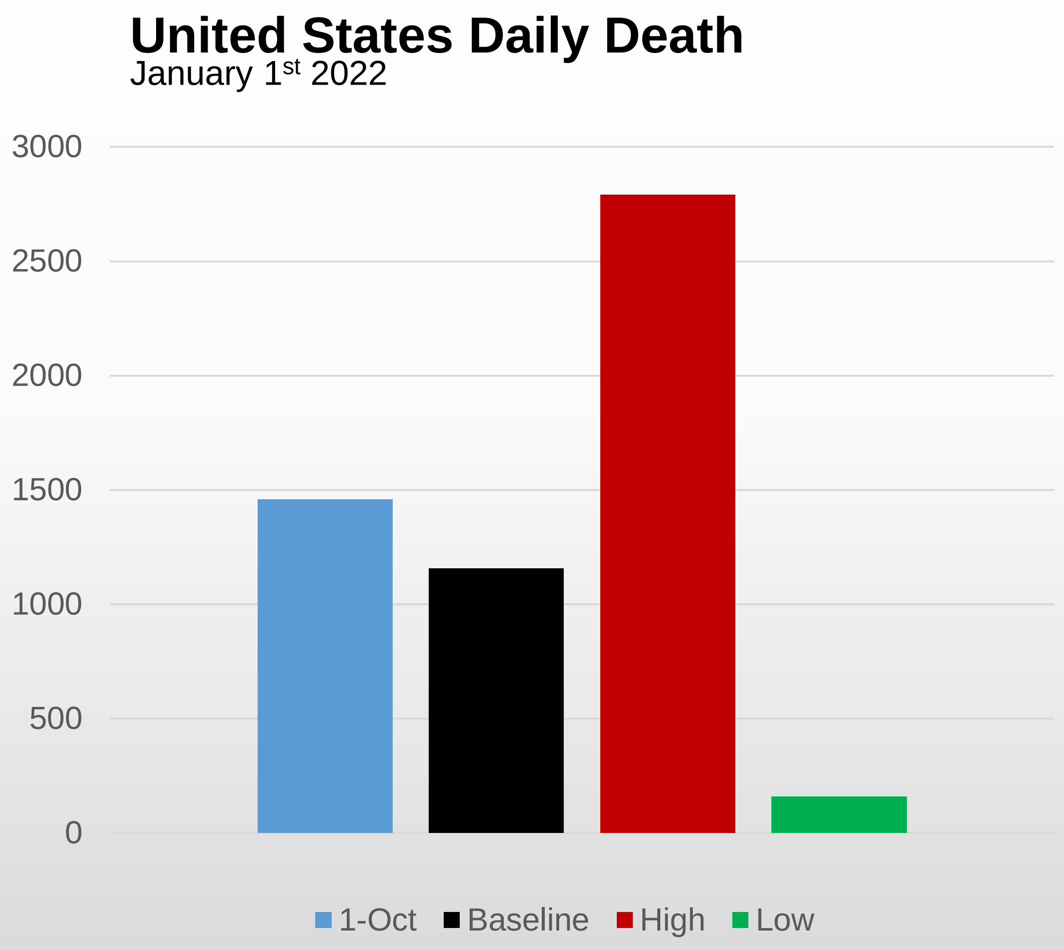
Synchronized World Growth?

- Does Covid reset growth worldwide onto similar recovery starting dates?
- Dry Bulk Shipbuilding is lean.
- 2005-2006?

Risks

Risk: Covid's Path





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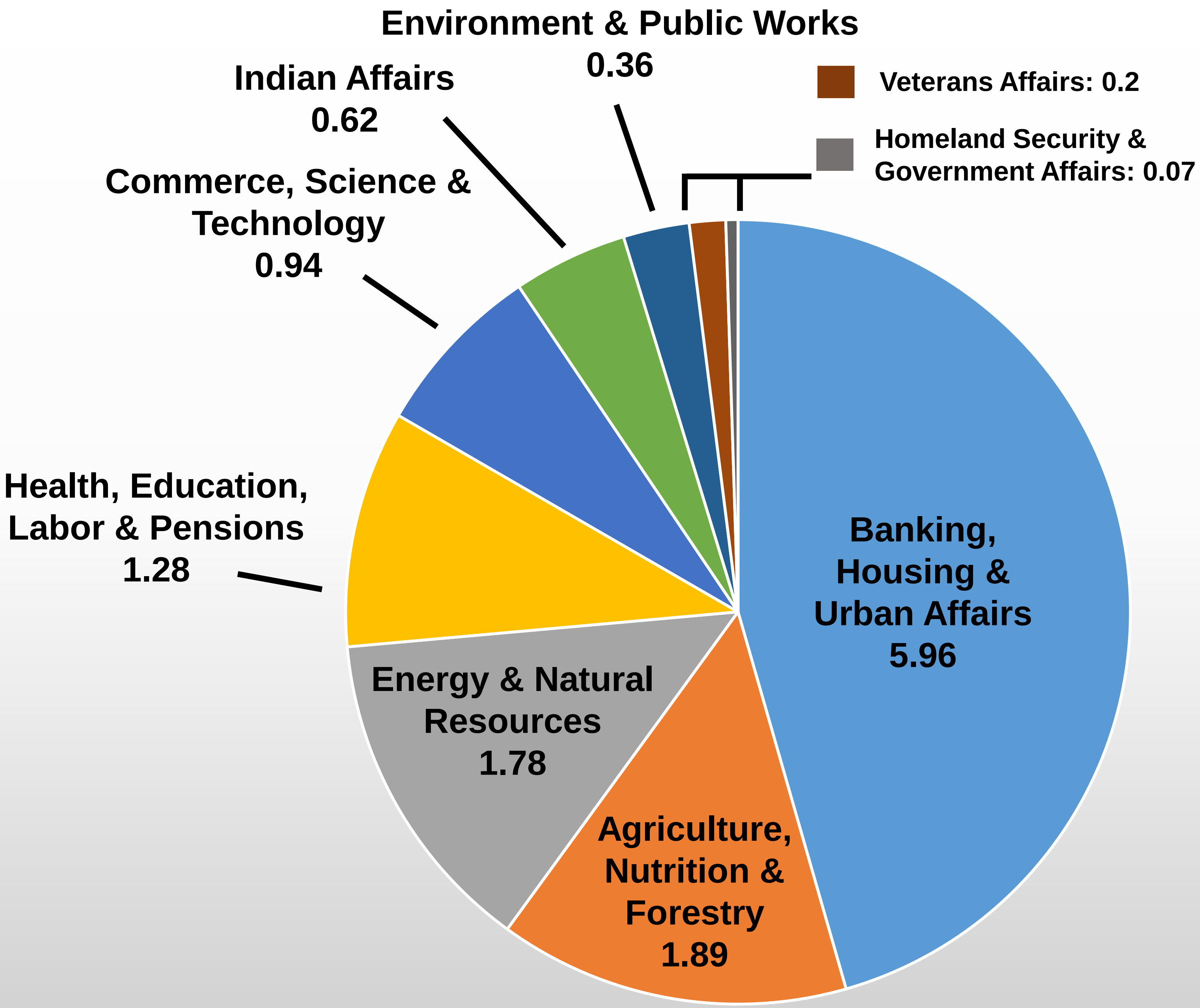
"Human Infrastructure" Cement Consumption

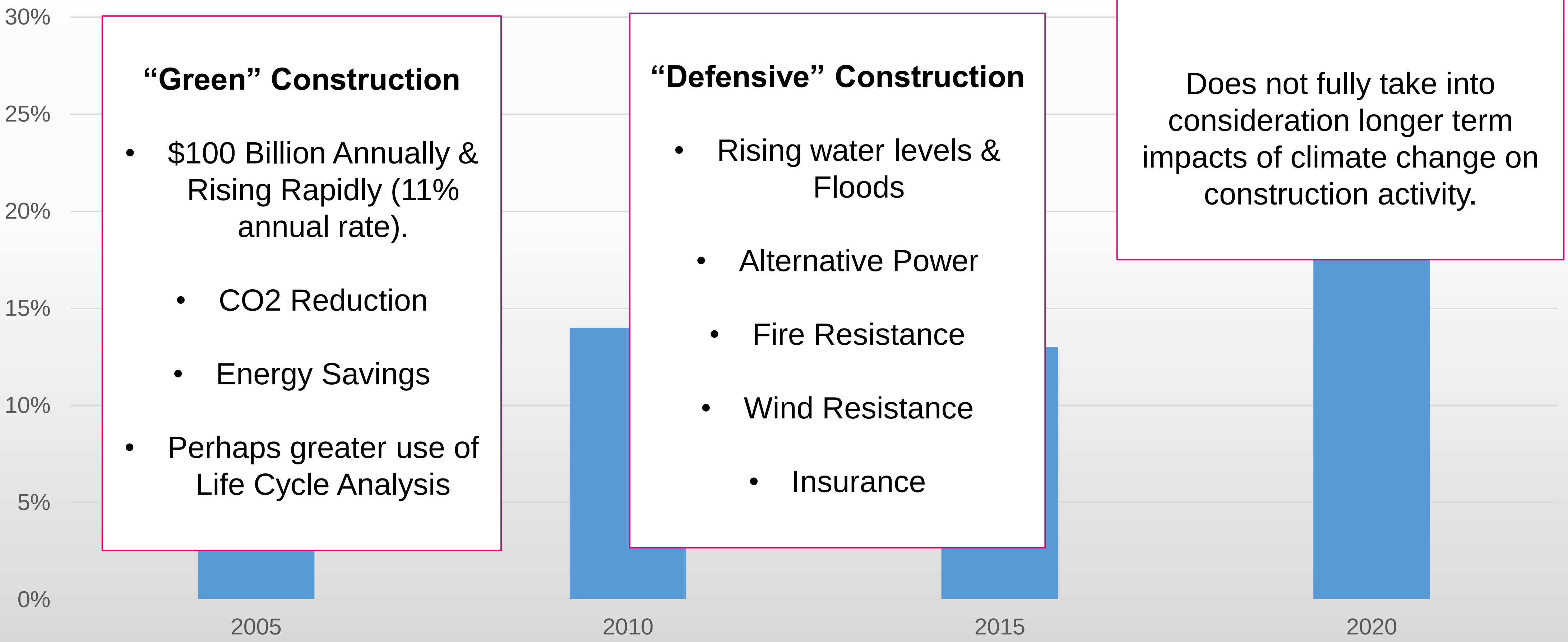
Based on $1.75 Trillion

13 MMT Over 10 years



Climate Change

Extremely Important to Address



“Green” Construction

- $100 Billion Annually & Rising Rapidly (11% annual rate).
- CO2 Reduction
- Energy Savings
- Perhaps greater use of Life Cycle Analysis

“Defensive” Construction

- Rising water levels & Floods
- Alternative Power
- Fire Resistance
- Wind Resistance
- Insurance

Macroeconomic Summary does not take into consideration climate change initiative that could disrupt/alter economic growth.

Does not fully take into consideration longer term impacts of climate change on construction activity.

Source: Resources for the Future

New Market Development Feature

The MI Dashboard

Live Now
Sign into PCA's Website. Go to Economics

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Fall Cement Outlook

October 1, 2021

Ed Sullivan, SVP & Chief Economist