Commonwealth of Massachusetts

Capital Debt Affordability Committee

FY 23 Recommendation

December 2021

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1. Introduction

Capital Debt Affordability Committee Overview

Enabling Act

- The Capital Debt Affordability Committee was established by **Chapter 165 of the Acts of 2012, Section 60B** for the purposes of reviewing on a continuing basis the amount and condition of the Commonwealth's tax-supported debt, as well as the debt of certain state authorities.

Roles and Responsibilities

- Responsible for **providing an estimate** of the total amount of new Commonwealth debt that can **prudently** be authorized [i.e. issued] for the next fiscal year, taking into account certain criteria, to the Governor and Legislature on or before December 15 of each year.
  - Estimates are advisory and not binding on the Governor or the Legislature.
  - The Legislature is responsible for authorizing Commonwealth debt.
  - The Governor determines the total amount of capital spending for each fiscal year and the amount of new Commonwealth debt that he considers advisable to finance such spending.

Membership

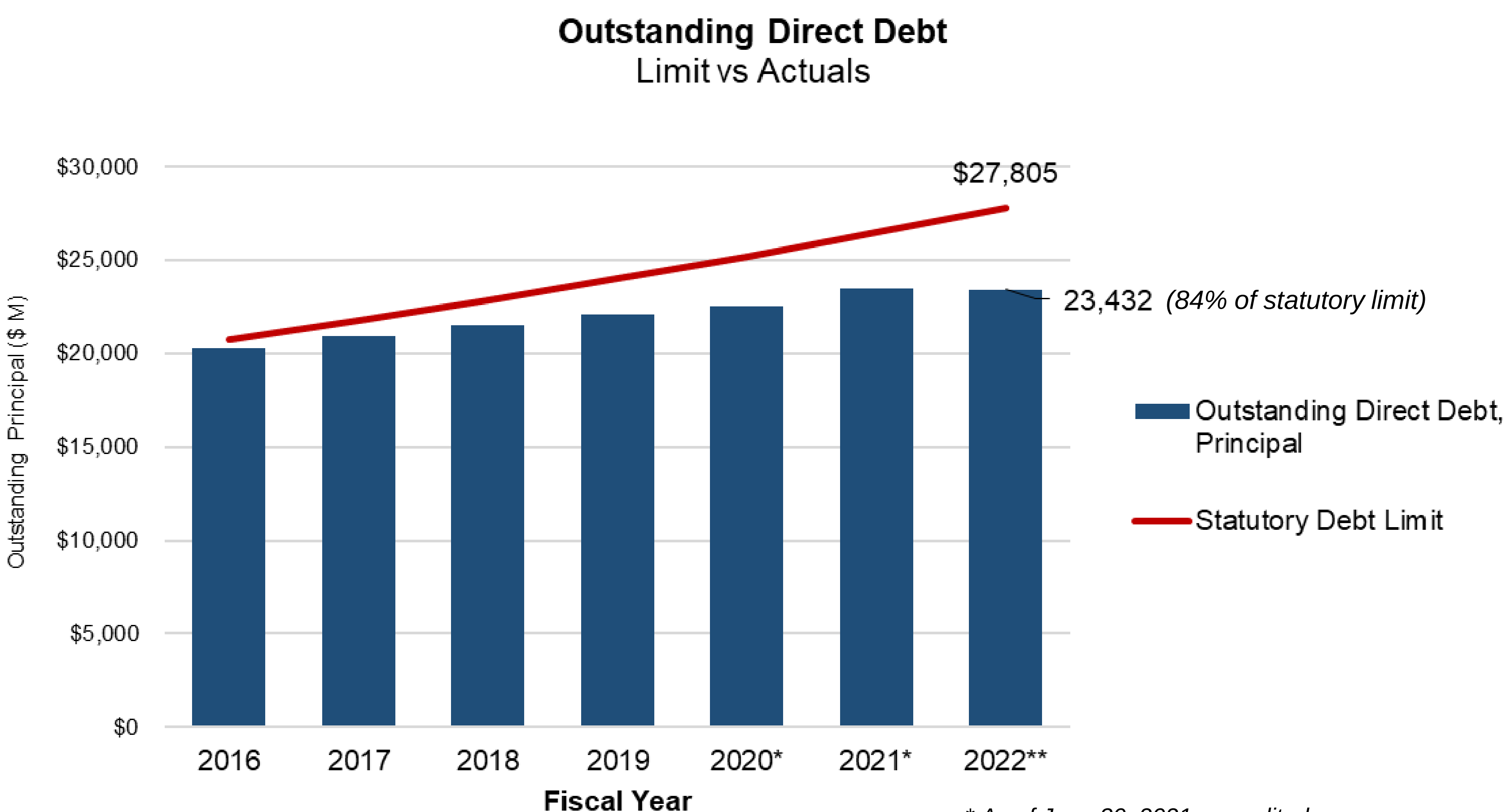
- The Committee consists of **seven voting members**, including the Secretary of Administration and Finance (who chairs the Committee), the State Treasurer, the Comptroller, the Secretary of Transportation, one appointee of the Governor and two appointees of the State Treasurer.
- The Committee also includes **nonvoting members**, including the House and Senate chairs and the ranking minority members of the Committees on Bonding, Capital Expenditures and State Assets, and the Committees on Ways and Means.

Statutory and Administrative Limits on Direct Debt

Statutory Debt Limit	➢ **Outstanding Debt Limit**: The amount of outstanding principal of Commonwealth “direct” debt is capped at **105%** of the previous fiscal year’s limit • FY 20 Limit: $25.2 billion • FY 21 Limit*: $26.5 billion • FY 22 Limit*: $27.8 billion • FY 23 Limit*: $29.2 billion
Debt Affordability Policy	➢ **Annual Borrowing Limit:** Annual Debt Service Payments < **8%** of budgeted revenues • FY 20 Limit: $3.8 billion • FY 21 Limit: $4.2 billion • FY 22 Limit: $4.3 billion ➢ **Growth Limit**: Annual growth in the bond cap ≤ **$125 million**.

**Unaudited*

Historical Statutory Debt Limit vs. Actual Outstanding Direct Debt

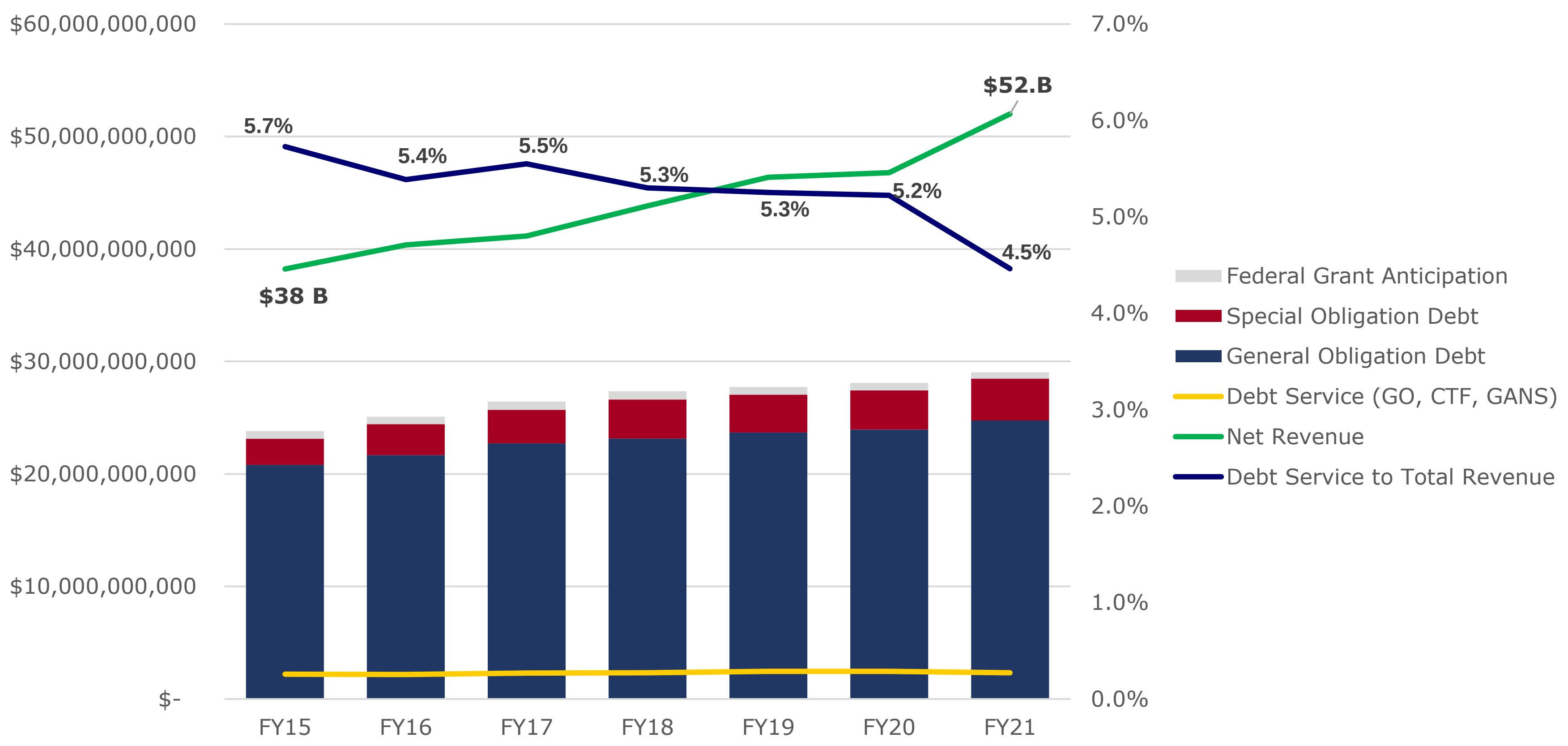


** As of June 30, 2021, unaudited*
*** As of July 31, 2021, unaudited*

SOURCE: Commonwealth Information Statement, as supplemented November 2021

Historical Long Term Debt Service vs. Net Revenues

❖ Long term debt service has been less than 6% of net revenues



The Committee Considers the Following to Inform its Estimate (1 of 2)

State Debt Outstanding	➢ Amount of state bonds that, during the next fiscal year, will be (1) outstanding and, (2) authorized but unissued
Capital Plan Spending	➢ The Commonwealth's Capital Investment Plan (CIP) prepared by the Secretary of Administration and Finance (A&F)
10 Year Debt Service	➢ Projections of debt service requirements during the next 10 fiscal years
Credit Ratings	➢ The criteria that bond rating agencies use to judge the quality of issues of state bonds
Authorization	➢ The effect of authorizations of new state debt on each of the factors in this subsection

The Committee Considers the Following to Inform its Estimate (2 of 2)

Debt Ratios Analysis	➢ Identification of pertinent debt ratios, such as debt service to General Fund revenues, debt to personal income, debt to estimated full-value of property, and debt per capita
State Comparisons	➢ A comparison of the debt ratios for the 5 other states in New England, New York and 5 other states the committee determines to offer a fair comparison to the commonwealth
Fixed, Variable, and Hedged Debt	➢ A description of the percentage of the state's outstanding general obligation bonds constituting fixed rate bonds, variable rate bonds, bonds that have effective rates through a hedging contract
Other Tax Supported Debt	➢ The amount of issuances, debt outstanding, and debt service requirement of other classes of commonwealth tax supported debt as well as other debt of commonwealth units

Debt Affordability and Revenue Analysis Approach

Debt Service Included in Affordability Analysis	➢ For the purposes of the debt affordability analysis, **debt service includes** programs expected to be funded both within and outside of the bond cap, including: ✓ Principal and interest payments on all general obligation debt; ✓ Special obligation bonds secured by a specified portion of the motor fuels excise tax; ✓ Special obligation bonds issued to fund the Accelerated Bridge Program and the Rail Enhancement Program; ✓ Special obligation bonds secured by the Convention Center Fund; ✓ General obligation contract assistance payment obligations; and ✓ Budgetary contract assistant payment obligations on certain capital lease financings.
Budgeted Revenues Included in Affordability Analysis	➢ **Budgeted revenue includes** all Commonwealth taxes and other revenues available to pay Commonwealth operating expenses, including debt service, pensions and other budgetary obligations. ➢ It does not include off-budget revenues dedicated to the MBTA, the MSBA and the Massachusetts Convention Center Authority (MCCA). ❖ *This inclusive definition ensures that while some programs are expected to be funded outside of the bond cap, the related debt service costs of the programs should be fully accounted for under the debt affordability policy in recommending the bond cap at appropriate limits.*

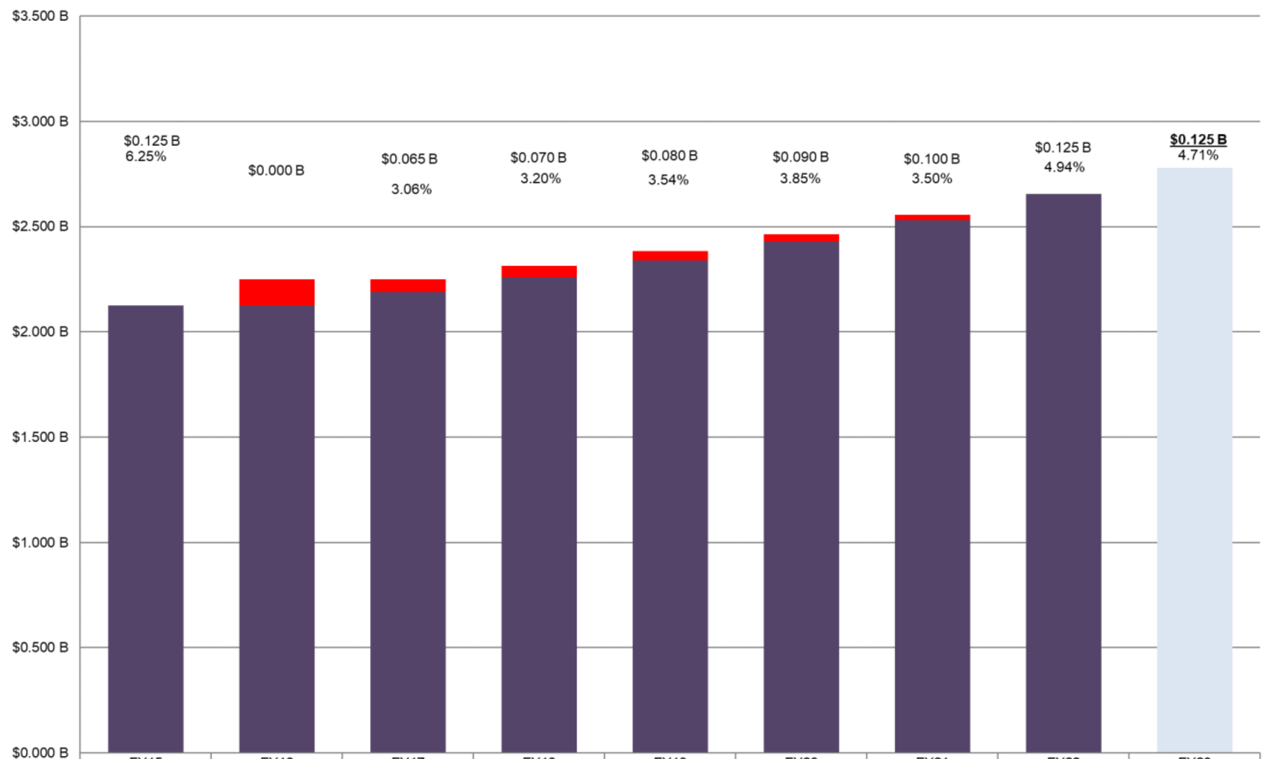
DAC Recommendation Work Plan

Meeting	Topics	Considerations
September 10 **(1pm)**	MA Debt Portfolio Overview	• Direct Debt ○ Outstanding Debt ○ Projected Debt Service ○ Fixed vs. Variable vs. Hedged • Other Debt related Obligations
September 17 **(1pm)**	Credit Factors	• Credit Ratings Review • Debt Ratio Analysis • Comparisons to Peers
October 22 **(1pm)**	Revenue Update CIP Spending Update	• DOR Revenue Update • Commonwealth's Capital Investment Plan (CIP)
November 19 **(1pm)**	Debt Affordability Analysis	• Model in Practice • Preliminary Scenario Review
December 3 **(1pm)**	Debt Affordability Analysis Recommendation	• Continued discussion on analysis • Review and Approve Recommendation

**Subject to change*

2. Advisory Recommendation for Fiscal 2023

FY 2023 Bond Cap Recommendation: $125 Million Increase over FY 2022



	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23
Increase to Bond Cap	$0.125 B	$0.000 B	$0.065 B	$0.070 B	$0.080 B	$0.090 B	$0.100 B	$0.125 B	$0.125 B
Annual Cap Growth (%)	6.25%	0.00%	3.06%	3.20%	3.54%	3.85%	3.50%	4.94%	4.71%
Recommended Cap vs. $125M Max	$0.000 B	$0.125 B	$0.060 B	$0.055 B	$0.045 B	$0.035 B	$0.025 B	$0.000 B	$0.000 B
Recommended Bond Cap	$2.125 B	$2.125 B	$2.190 B	$2.260 B	$2.340 B	$2.430 B	$2.530 B	$2.655 B	$2.780 B

DAC Recommendation (approved unanimously 12/3): Voted to recommend to the Governor a bond cap increase of $125 M bringing the total recommended bond cap amount for FY23 to **$2.78 B.**

DAC Debt Affordability Model Inputs

	Input	Description
Held Constant Across Scenarios	**Debt Service on Existing Debt**	• Projected debt service schedules for existing debt; based on DBC reports
	Contract assistance payments	• Projected payment schedules for existing contract assistance agreements
	Issuance maturity terms for new debt	• Assumed bond maturity distribution across future issuances • Maturity Terms: 1 -10 yrs; 11 – 20 yrs; & 21 – 30yrs)
	Future Bond Cap Growth	• Assumed rate at which the bond cap will grow annually
Adjusted Across Scenarios	**Interest rates for new debt**	• Assumed interest rates for future debt issuances by maturity term
	Revenue Growth	• Assumed rate of growth for tax revenue
	FY23 Projected Bond Cap **(DAC Recommendation)**	• Projected new direct debt issued in FY23

DAC Debt Affordability Model Inputs: Working Assumptions

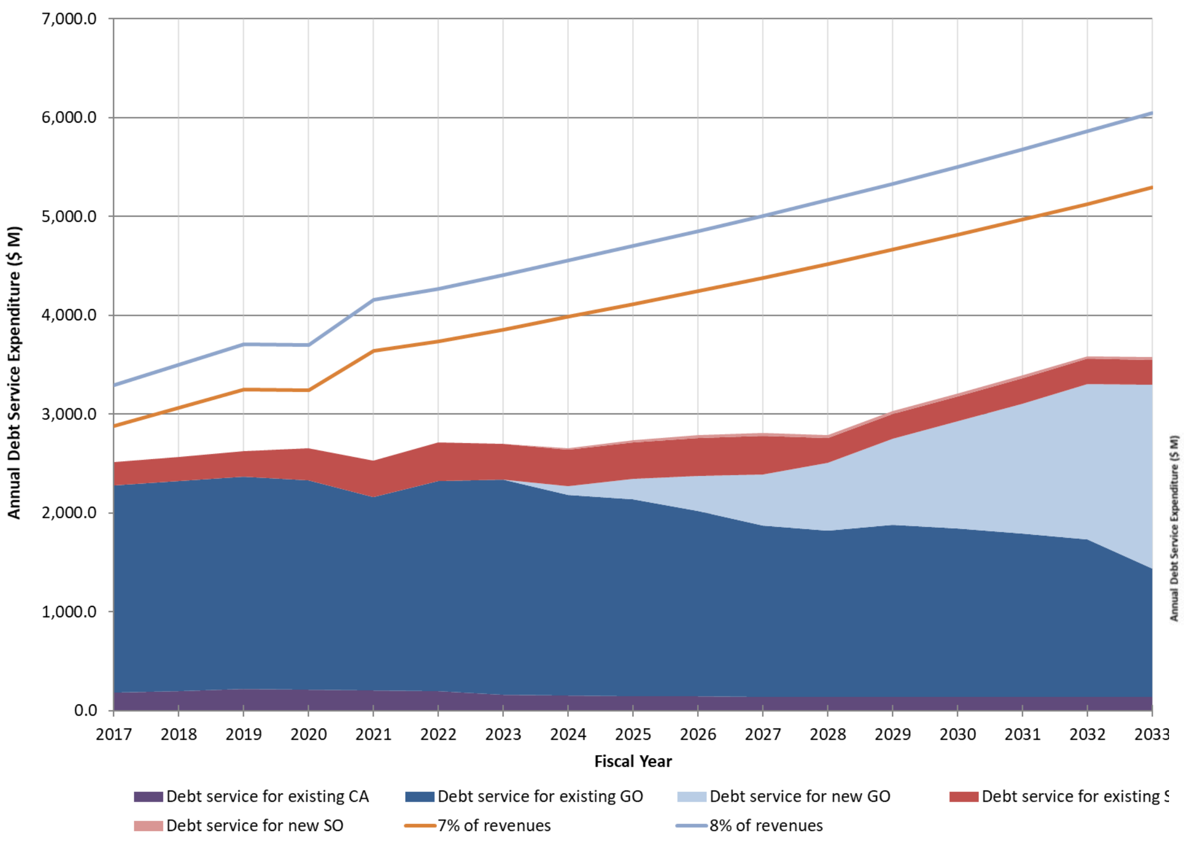
Model Input	Scenario 1 (moderate)	Scenario 2 (conservative)	Stress Test Scenario
FY22 Starting Interest Rates *Model assumes interest rates increase 0.5% annually through 2027, based on Moody's projected growth rate for 2022 - 2027*	**1.5% - 2.3%** Based on Moody's	**1.5% - 2.3%** Based on Moody's	**2.6% - 3.4%** Increased Moody's 2022 projection by 1.1%
Revenue Growth	**3.2%** Lowest 20-yr tax CAGR	**1.6%** Lowest 10-yr tax CAGR	**1.6%** Lowest 10-yr tax CAGR
Bond Cap Growth	In all scenarios assume bond cap grows annually by $125M over the next 30 years		

Interest Rate Assumption Details

Scenario	Bond Maturity	2022	2023	2024	2025	2026	2027+
Moderate and Conservative Scenarios	1 -10 years	1.5%	2.0%	2.5%	3.1%	3.6%	4.2%
	11 – 20 years	2.1%	2.6%	3.1%	3.7%	4.2%	4.8%
	21 – 30 years	2.3%	2.9%	3.4%	3.9%	4.5%	5.0%
Stress Test	1 -10 years	2.6%	3.1%	3.6%	4.2%	4.7%	5.3%
	11 – 20 years	3.2%	3.7%	4.2%	4.8%	5.3%	5.9%
	21 – 30 years	3.4%	4.0%	4.5%	5.0%	5.6%	6.1%

$125 Million Bond Cap
Preliminary Scenario 1 - Moderate

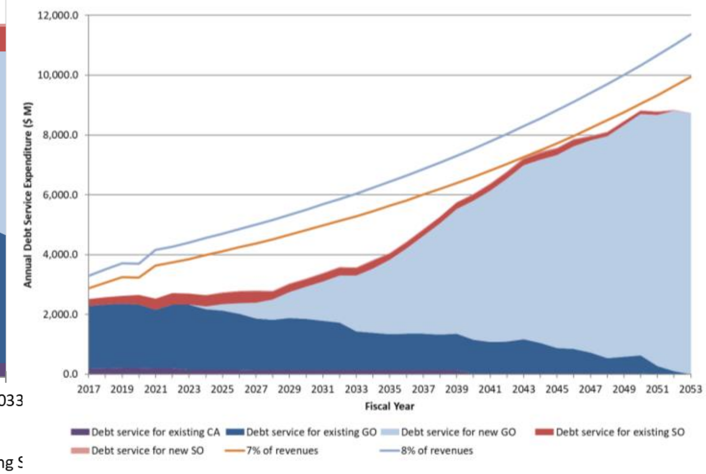
10-Year Snapshot



Modeling Assumptions

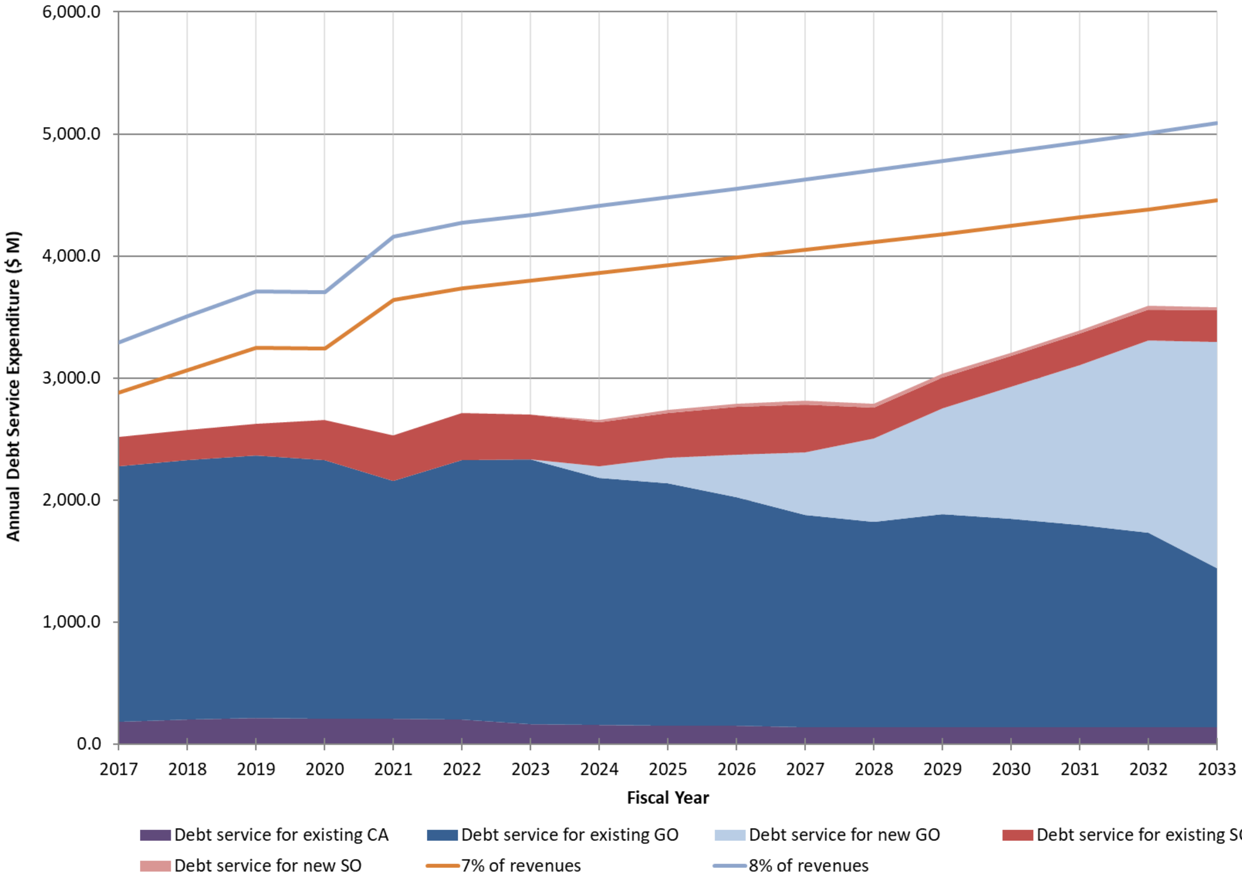
- Interest Rates: 1.5% - 5.0%
- Annual Revenue Growth: 3.2%
- Bond cap continues to increase annually

30-Year Snapshot



$125 Million Bond Cap
Preliminary Scenario 2 - Conservative

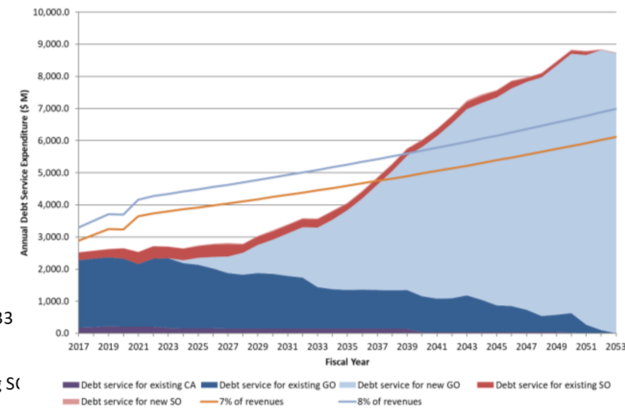
10-Year Snapshot



Modeling Assumptions

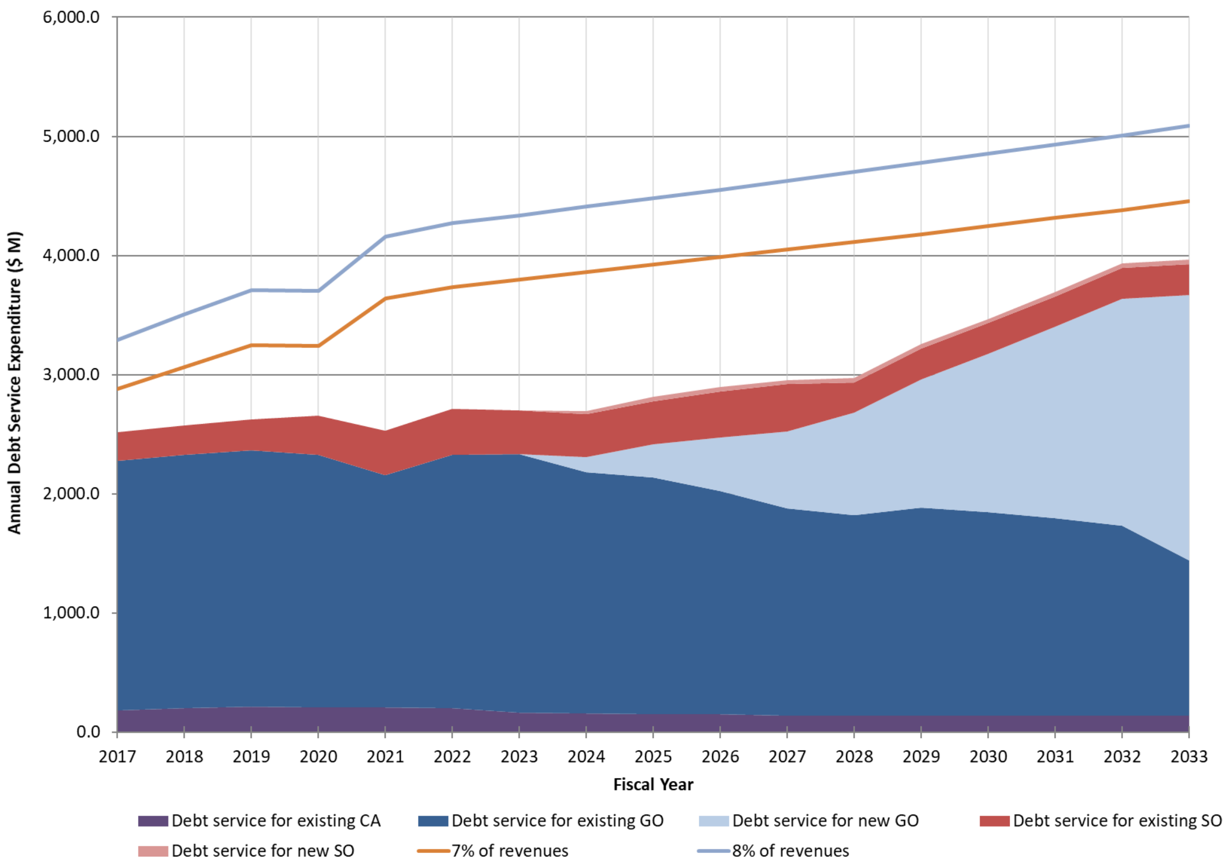
- ❖ Interest Rates: 1.5% - 5.0%
- ❖ Annual Revenue Growth: 1.6%
- ❖ Bond cap continues to increase annually

30-Year Snapshot



$125 Million Bond Cap
Preliminary Scenario 3 – Stress Test

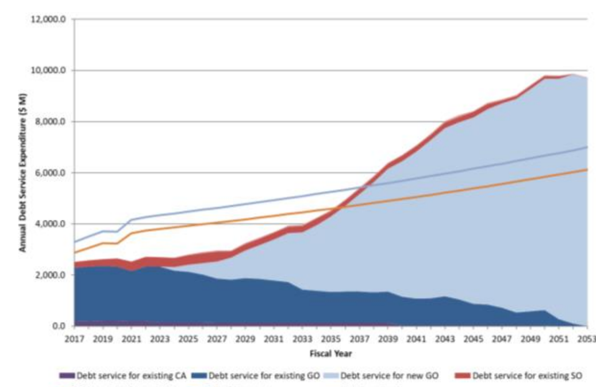
10-Year Snapshot



Modeling Assumptions

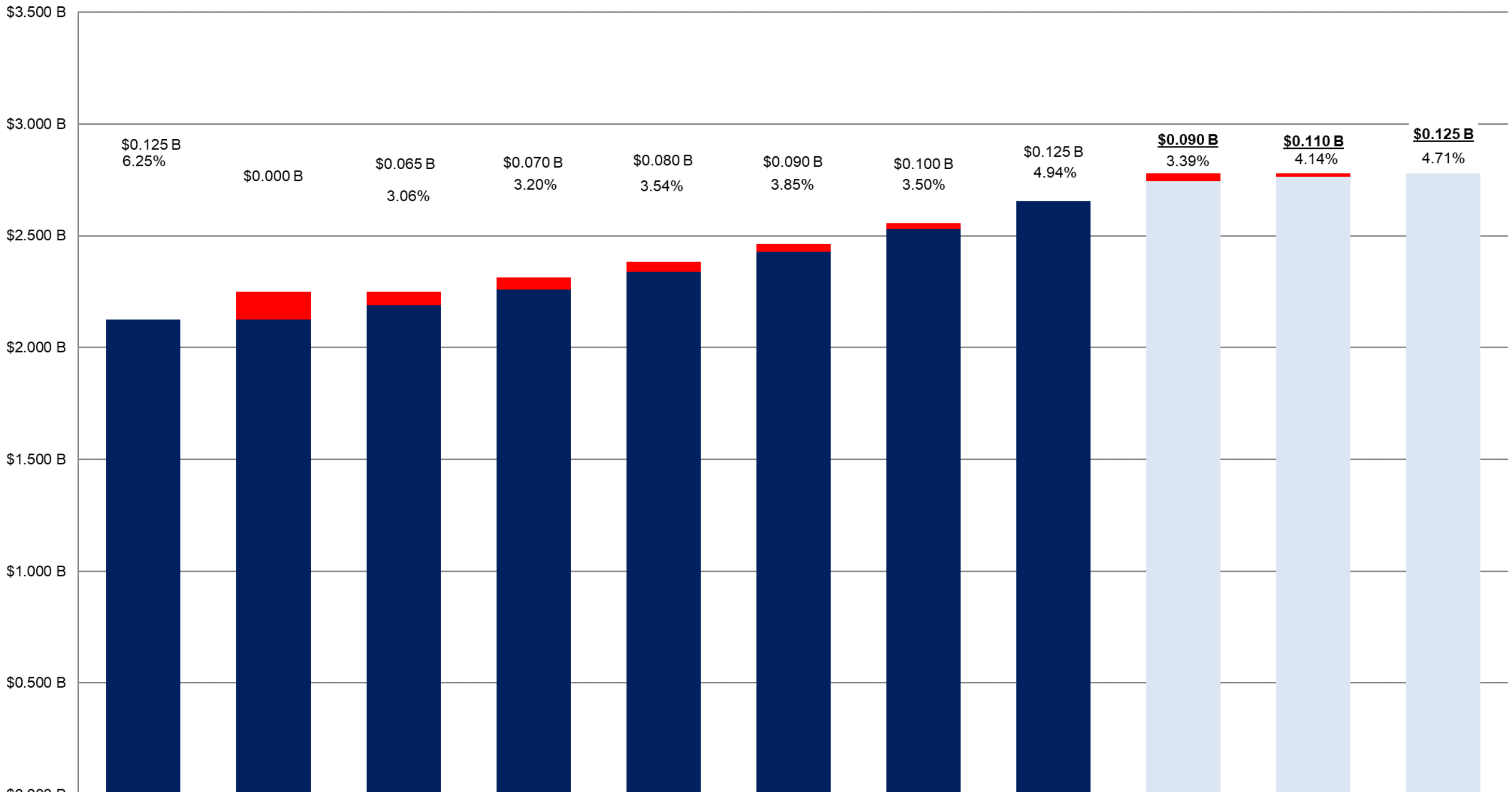
- ❖ Interest Rates: 2.6% - 6.1%
- ❖ Annual Revenue Growth: 1.6%
- ❖ Bond cap continues to increase annually

30-Year Snapshot



3. Additional DAC Modeling

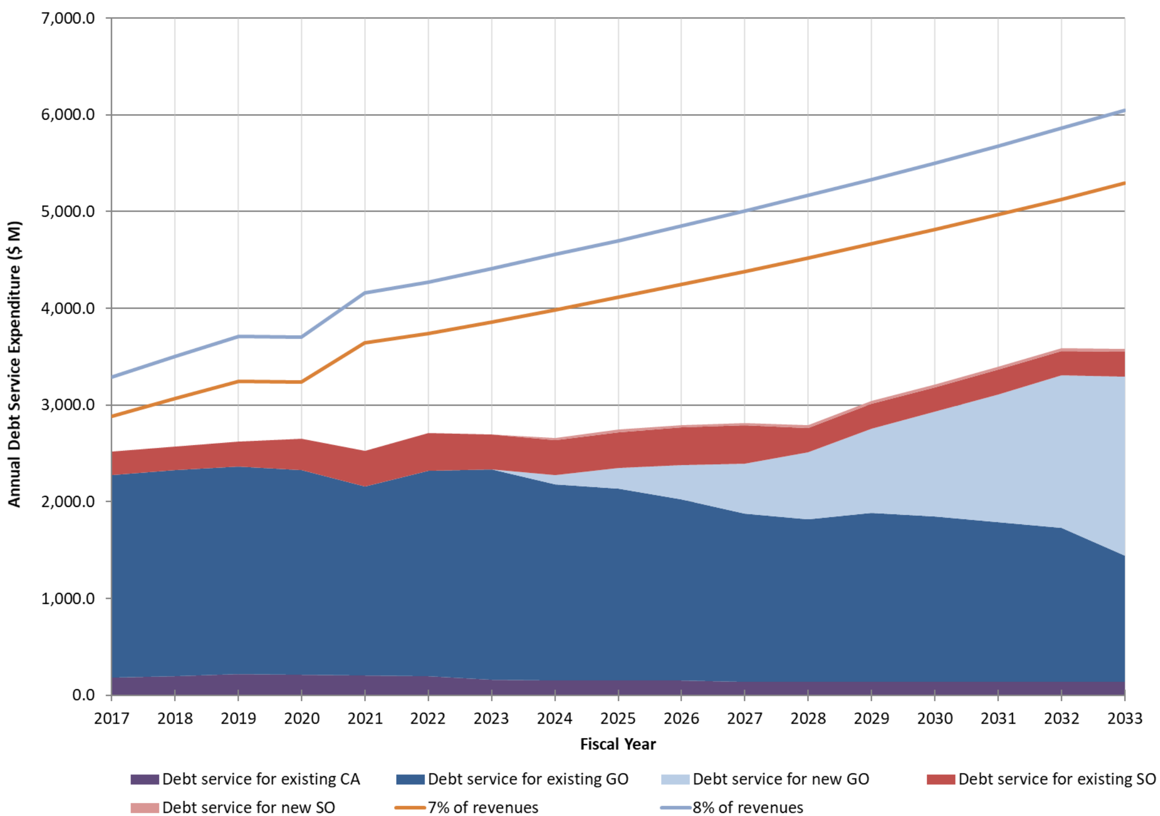
FY 2023 Bond Cap Recommendation: $90M vs $110M vs. $125M



	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23(a)	FY23(b)	FY23(c)
Increase to Bond Cap	$0.125 B	$0.000 B	$0.065 B	$0.070 B	$0.080 B	$0.090 B	$0.100 B	$0.125 B	$0.090 B	$0.110 B	$0.125 B
Annual Cap Growth (%)	6.25%	0.00%	3.06%	3.20%	3.54%	3.85%	3.50%	4.94%	3.39%	4.14%	4.71%
Recommended Cap vs. $125M Max	$0.000 B	$0.125 B	$0.060 B	$0.055 B	$0.045 B	$0.035 B	$0.025 B	$0.000 B	$0.035 B	$0.015 B	$0.000 B
Recommended Bond Cap	$2.125 B	$2.125 B	$2.190 B	$2.260 B	$2.340 B	$2.430 B	$2.530 B	$2.655 B	$2.745 B	$2.765 B	$2.780 B

$90 Million Bond Cap
Preliminary Scenario 1 – Moderate

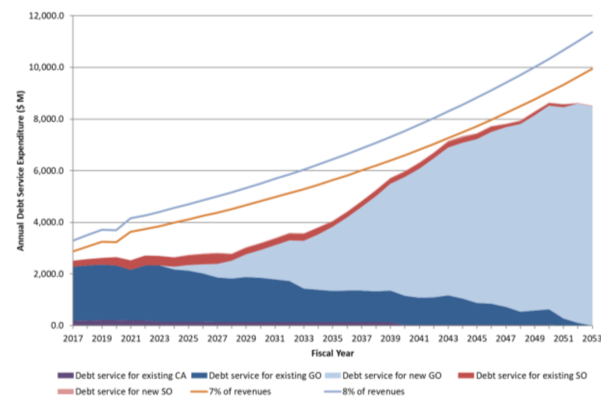
10-Year Snapshot



Modeling Assumptions

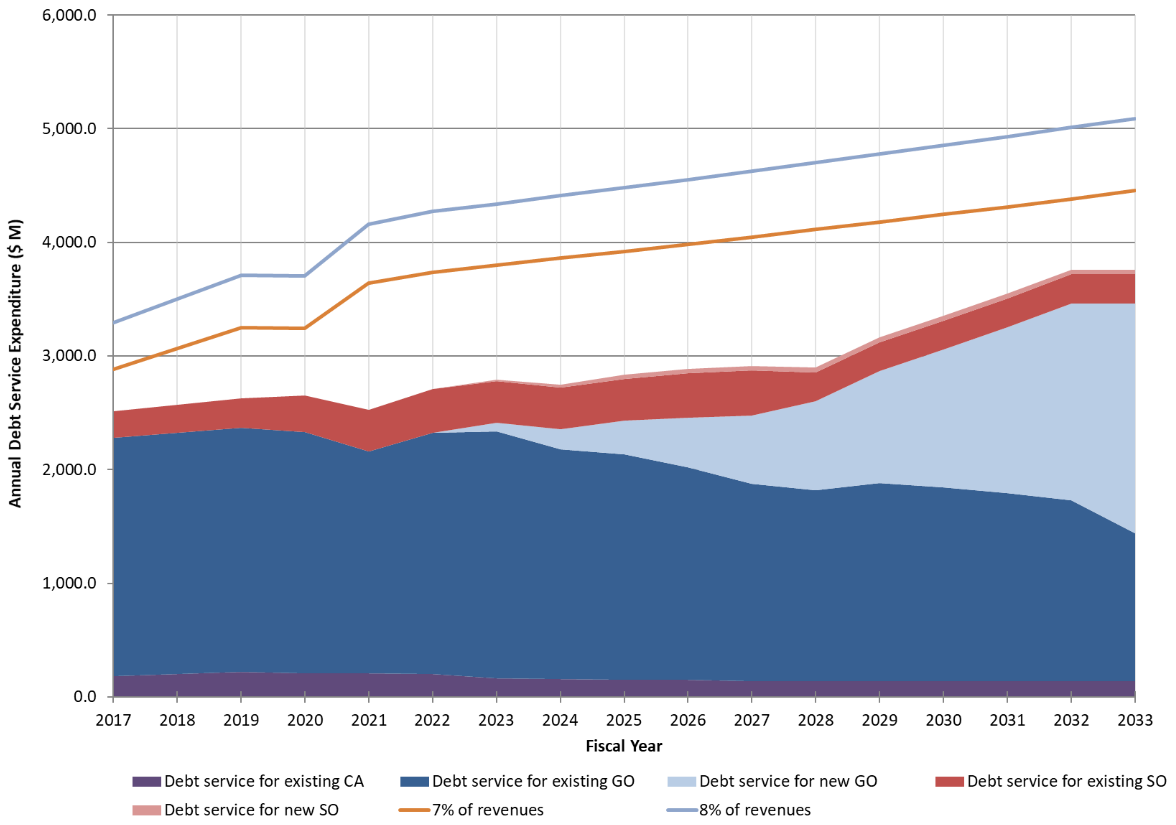
- ❖ Interest Rates: 1.5% - 5.0%
- ❖ Annual Revenue Growth: 3.2%
- ❖ Bond cap continues to increase annually

30-Year Snapshot



$90 Million Bond Cap
Preliminary Scenario 2 - Conservative

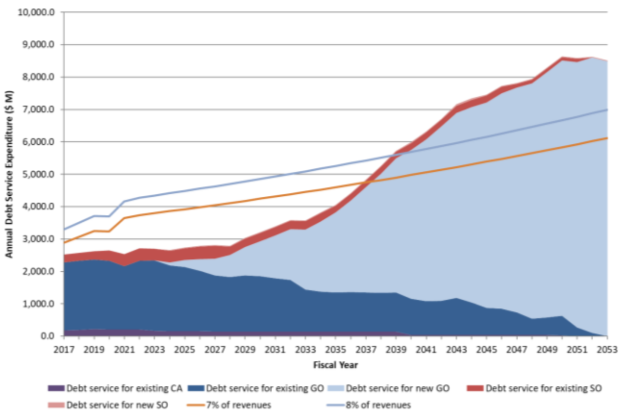
10-Year Snapshot



Modeling Assumptions

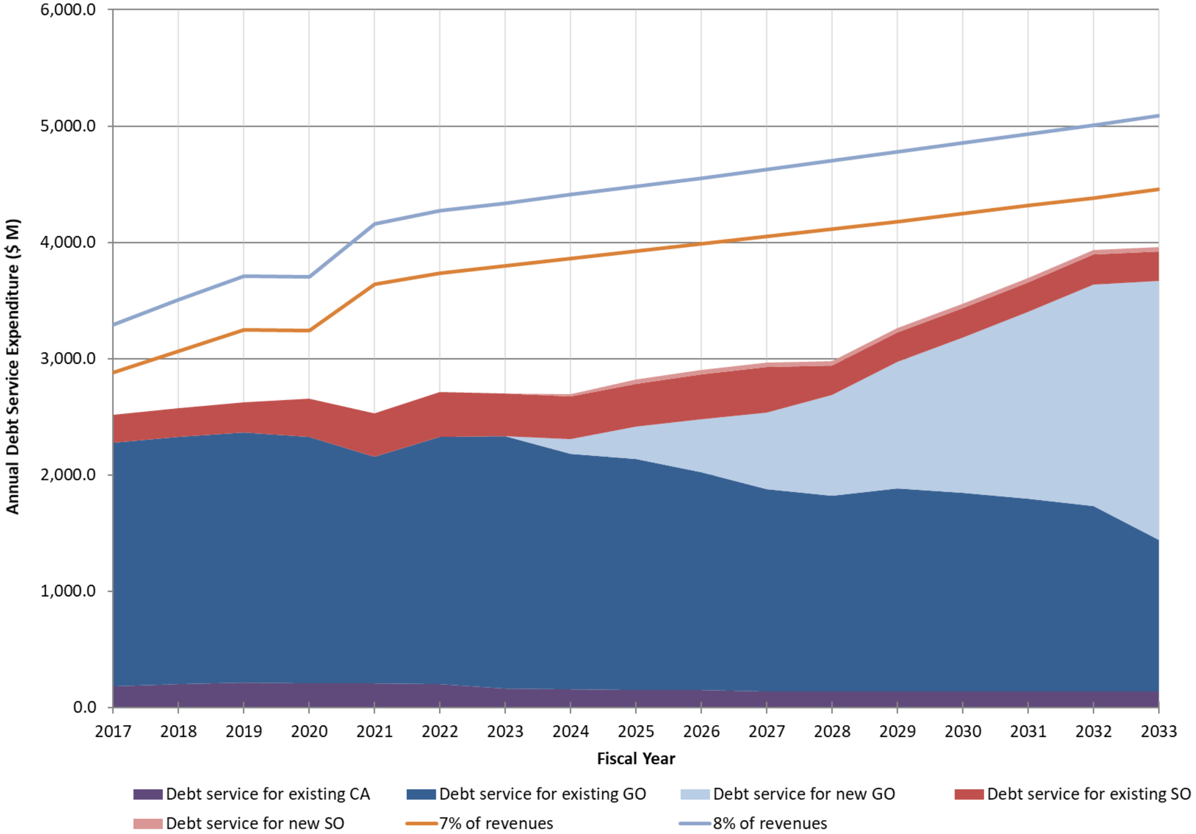
- ❖ Interest Rates: 1.5% - 5.0%
- ❖ Annual Revenue Growth: 1.6%
- ❖ Bond cap continues to increase annually

30-Year Snapshot



$90 Million Bond Cap
Preliminary Scenario 3 – Stress Test

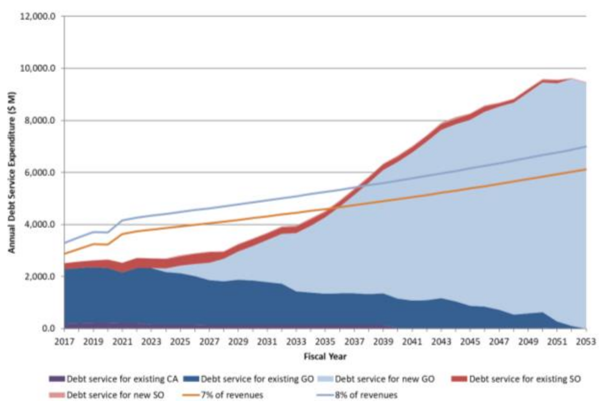
10-Year Snapshot



Modeling Assumptions

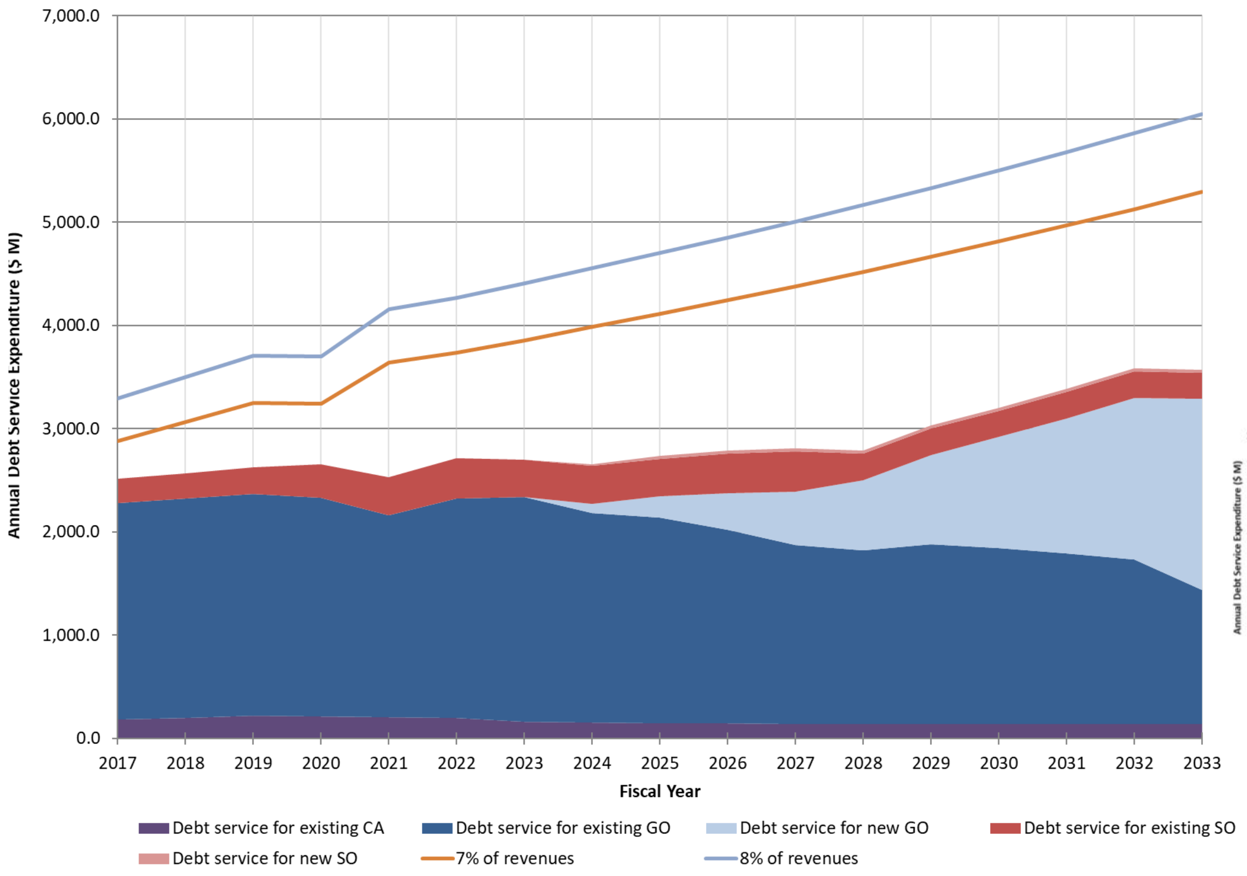
- ❖ Interest Rates: 2.6% - 6.1%
- ❖ Annual Revenue Growth: 1.6%
- ❖ Bond cap continues to increase annually

30-Year Snapshot



$110 Million Bond Cap
Preliminary Scenario 1 – Moderate

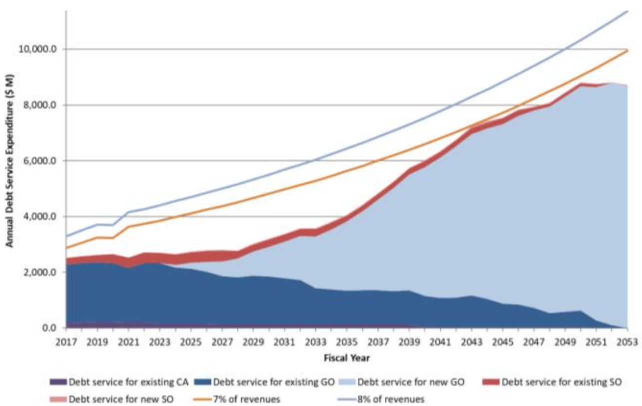
10-Year Snapshot



Modeling Assumptions

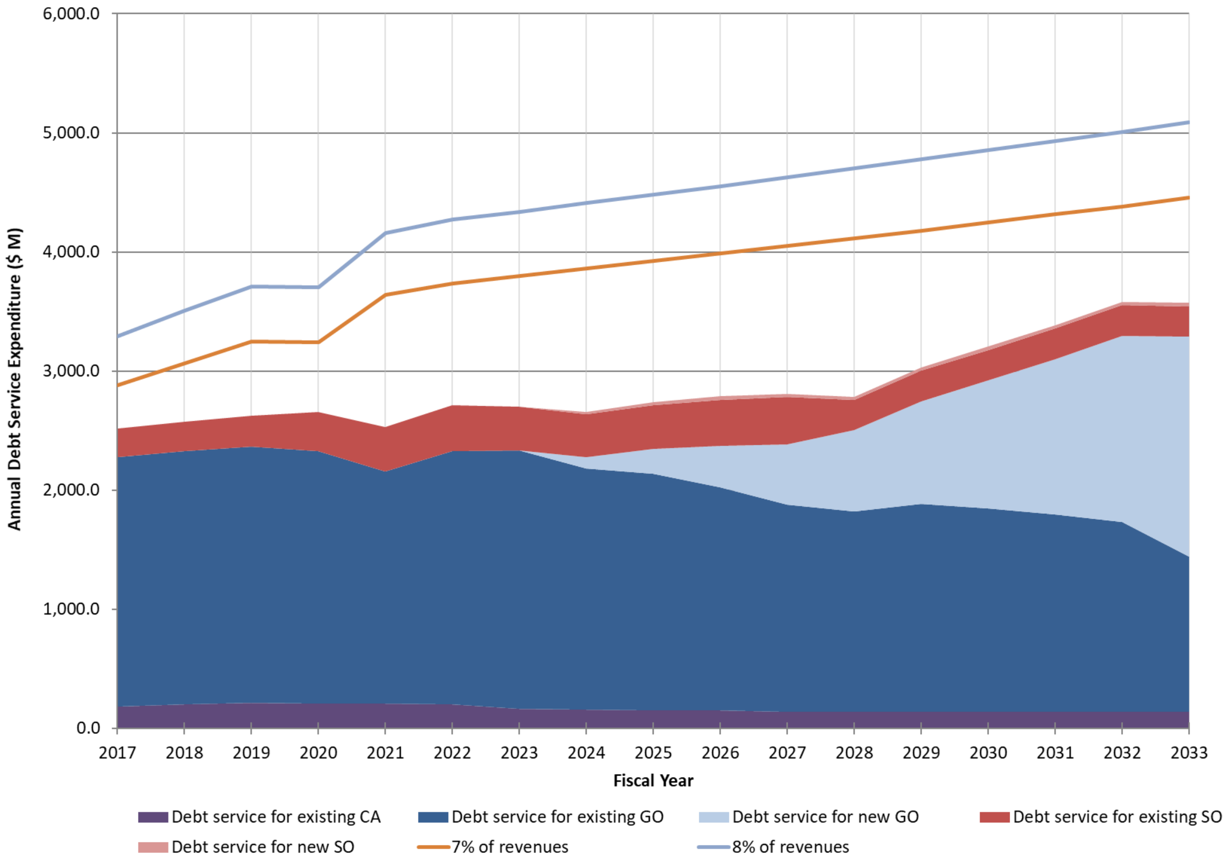
- ❖ Interest Rates: 1.5% - 5.0%
- ❖ Annual Revenue Growth: 3.2%
- ❖ Bond cap continues to increase annually

30-Year Snapshot



$110 Million Bond Cap
Preliminary Scenario 2 - Conservative

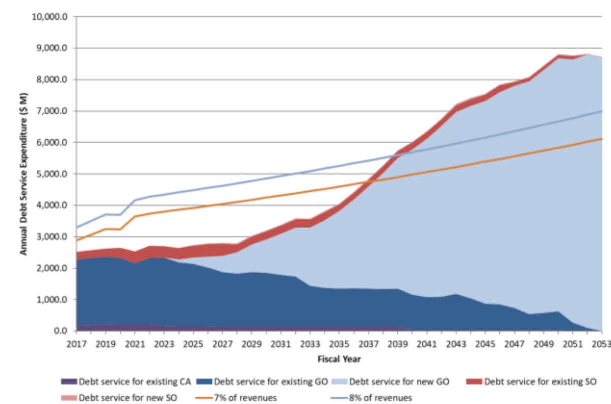
10-Year Snapshot



Modeling Assumptions

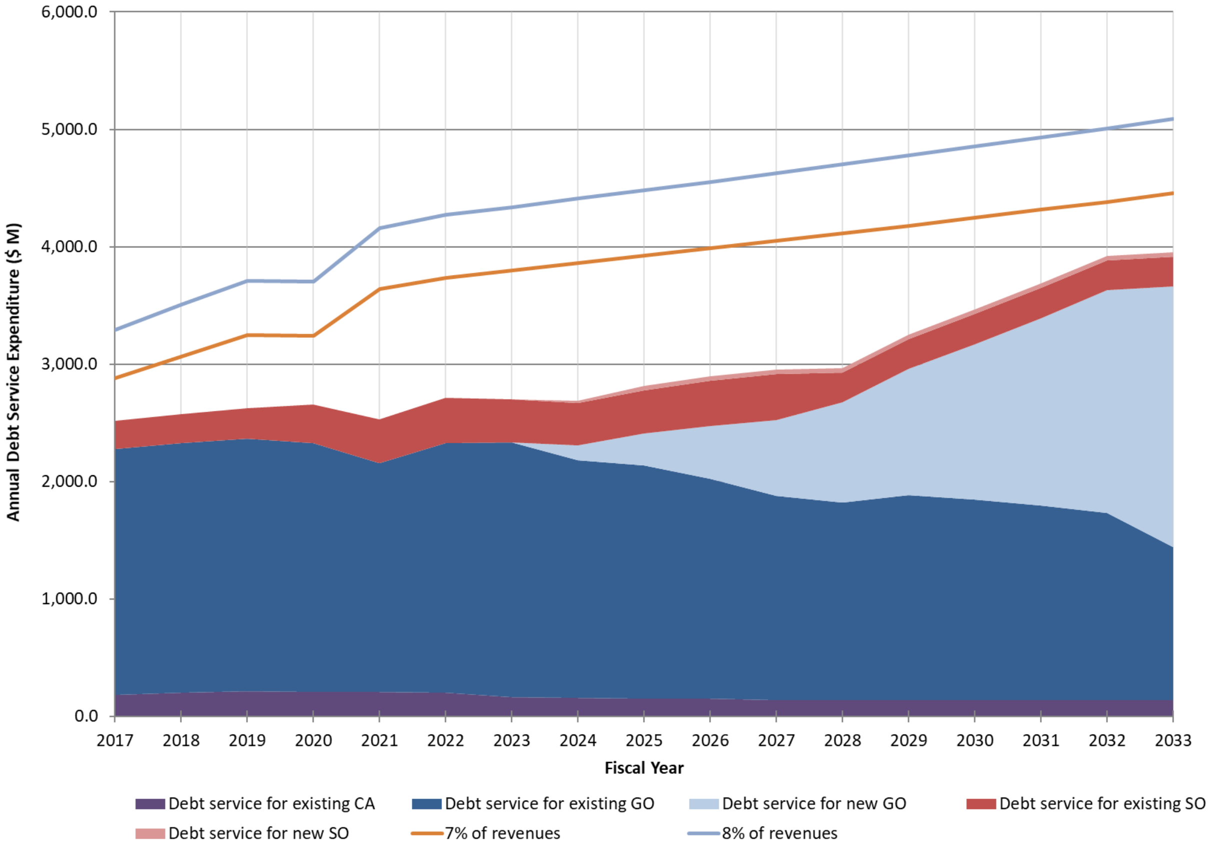
- ❖ Interest Rates: 1.5% - 5.0%
- ❖ Annual Revenue Growth: 1.6%
- ❖ Bond cap continues to increase annually

30-Year Snapshot



$110 Million Bond Cap
Preliminary Scenario 3 – Stress Test

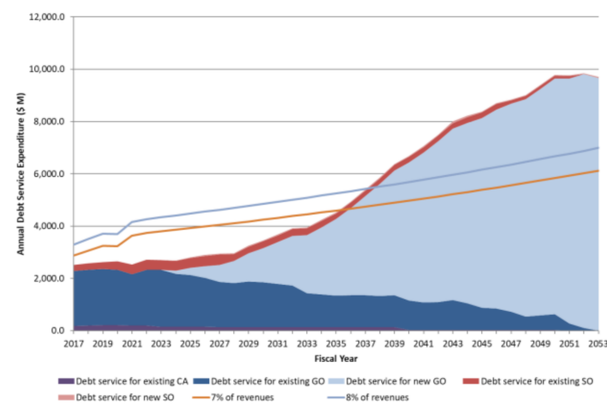
10-Year Snapshot



Modeling Assumptions

- ❖ Interest Rates: 2.6% - 6.1%
- ❖ Annual Revenue Growth: 1.6%
- ❖ Bond cap continues to increase annually

30-Year Snapshot



DAC Modeling Outcomes: $90M vs $110M vs $125M increase

Model Input	Moderate Scenario	Conservative Scenario	Stress Test Scenario
FY22 Starting Interest Rates *Model assumes interest rates increase 0.5% annually through 2027, based on Moody's projected growth rate for 2022 - 2027*	**1.5% - 2.3%** Based on prior year assumptions	**1.5% - 2.3%** Based on Moody's & IHS projections	**2.6% - 3.4%** Increased Moody's 2022 projection by 1.1%
Revenue Growth	**3.2%** Lowest 20-yr tax CAGR	**1.6%** Lowest 10-yr tax CAGR	**1.6%** Lowest 10-yr tax CAGR
Debt Service Target	**Moderate** **Target Met?**	**Conservative** **Target Met?**	**Stress Test** **Target Met?**
10-Year Outlook Annual Debt Service **< 8%** of Revenues	$90M: √ $110M: √ $125M: √	$90M: √ $110M: √ $125M: √	$90M: √ $110M: √ $125M: √
10-Year Outlook Annual Debt Service **< 7%** of Revenues	$90M: √ $110M: √ $125M: √	$90M: √ $110M: √ $125M: √	$90M: √ $110M: √ $125M: √
30-Year Outlook Annual Debt Service **< 8%** of Revenues	$90M: √ $110M: √ $125M: √	$90M: X (2039 and on) $110M: X (2039 and on) $125M: X (2039 and on)	$90M: X (2038 and on) $110M: X (2038 and on) $125M: X (2038 and on)

DAC Focus

DAC Recommendation Discussion

Modeling Takeaways

- All scenarios: debt service < 7% of revenues within the first 10 yrs
- Moderate scenarios: debt service < 7% of revenues over 30 yrs
- Conservative and stress test scenarios: debt service > 8% around 2038 (give or take a year depending on the scenario)
- Revenue growth *(vs interest rates) is* driver of whether debt service exceeds 7% of revenue

4. Revenue & Interest Rates

Interest Rates: Current Yield Curve on Munis

AAA Rated Muni Bonds

Issue	Maturity	Interest Rate (11/15)	Last Week's Rate
National	10 Year	1.20	1.15
National	20 Year	1.50	1.50
National	30 Year	1.70	1.70

AA Rated Muni Bonds

Issue	Maturity	Interest Rate (11/15)	Last Week's Rate
National	10 Year	1.30	1.25
National	20 Year	1.70	1.65
National	30 Year	1.90	1.85

A Rated Muni Bonds

Issue	Maturity	Interest Rate (11/15)	Last Week's Rate
National	10 Year	1.45	1.40
National	20 Year	1.85	1.75
National	30 Year	2.05	2.00

❖ The tables and charts provide yield rates for AAA, AA, and A rated municipal bonds in 10, 20 and 30 year maturity ranges.

- Rates reflect the approximate yield to maturity that an investor can earn in today's tax-free bond market.

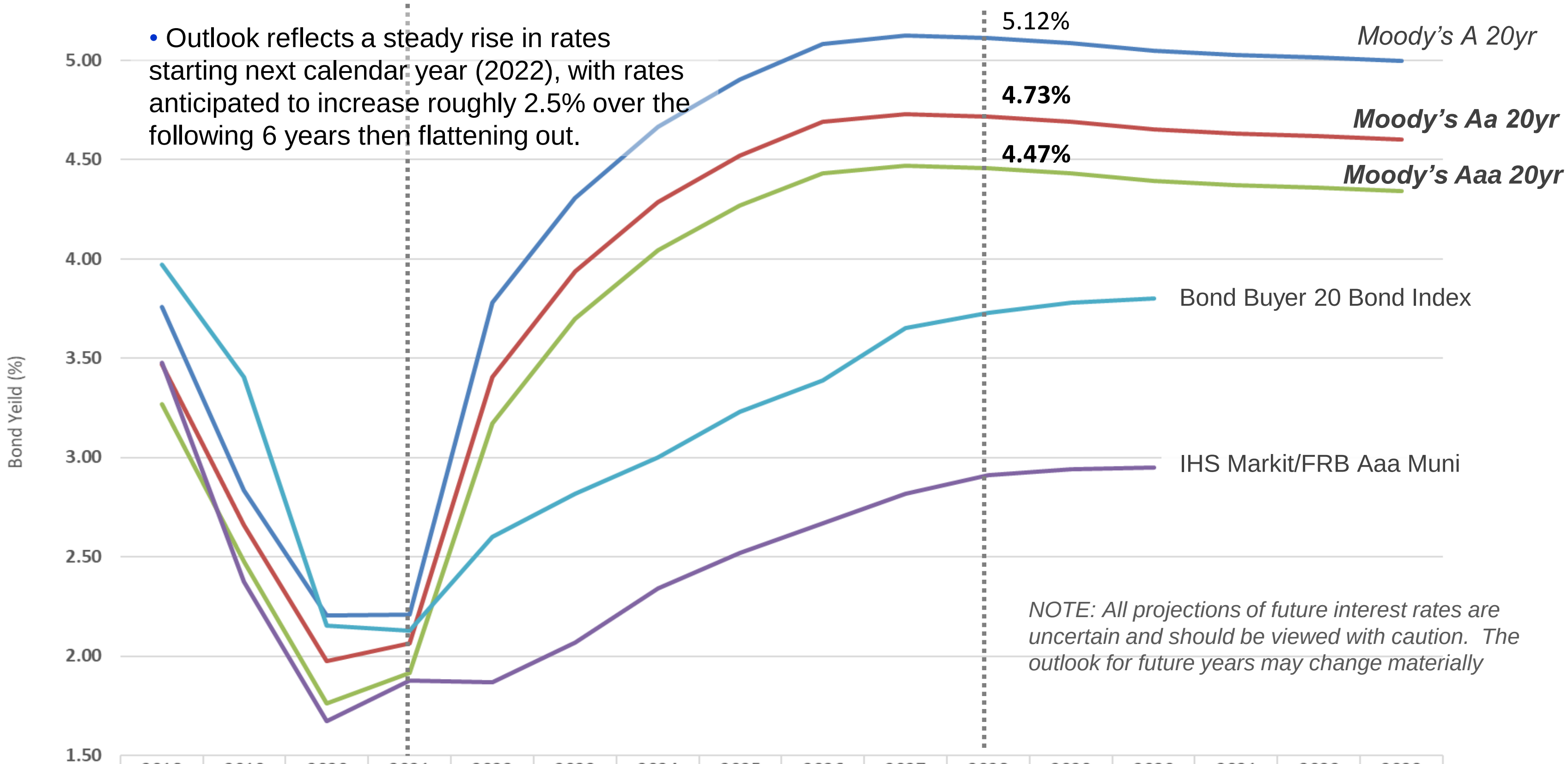
❖ Historically MA GO bonds trade in the range between Aaa and Aa.

- Current MA GO Ratings: Aa1/AA/AA+

❖ MA GO bond rates have recently been below 2%.

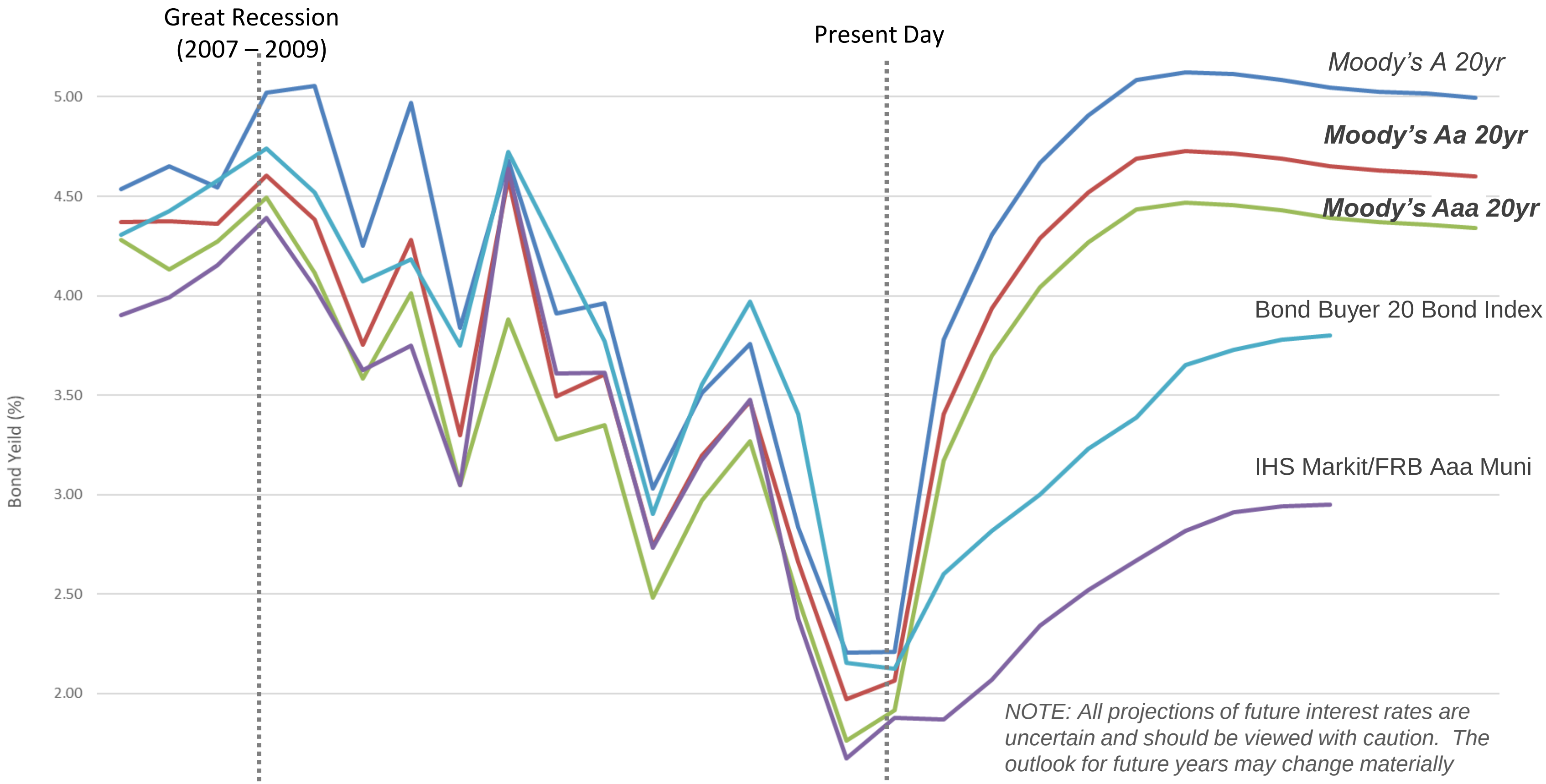
Source: FMS Bonds Inc.

Interest Rates: Yield Curve Outlook



	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Moody's A 20yr Muni	3.76	2.84	2.21	2.21	3.78	4.31	4.67	4.90	5.08	5.12	5.11	5.09	5.05	5.02	5.01	5.00
Moody's Aa 20yr Muni	3.47	2.66	1.97	2.06	3.41	3.94	4.29	4.52	4.69	4.73	4.72	4.69	4.65	4.63	4.62	4.60
Moody's Aaa 20yr Muni	3.27	2.48	1.76	1.91	3.17	3.70	4.04	4.27	4.43	4.47	4.46	4.43	4.39	4.37	4.36	4.34
IHS Aaa Muni Index	3.48	2.38	1.67	1.88	1.87	2.07	2.34	2.52	2.67	2.82	2.91	2.94	2.95			
Bond Buyer 20yr Index	3.97	3.41	2.15	2.13	2.60	2.82	3.00	3.23	3.39	3.65	3.73	3.78	3.80			

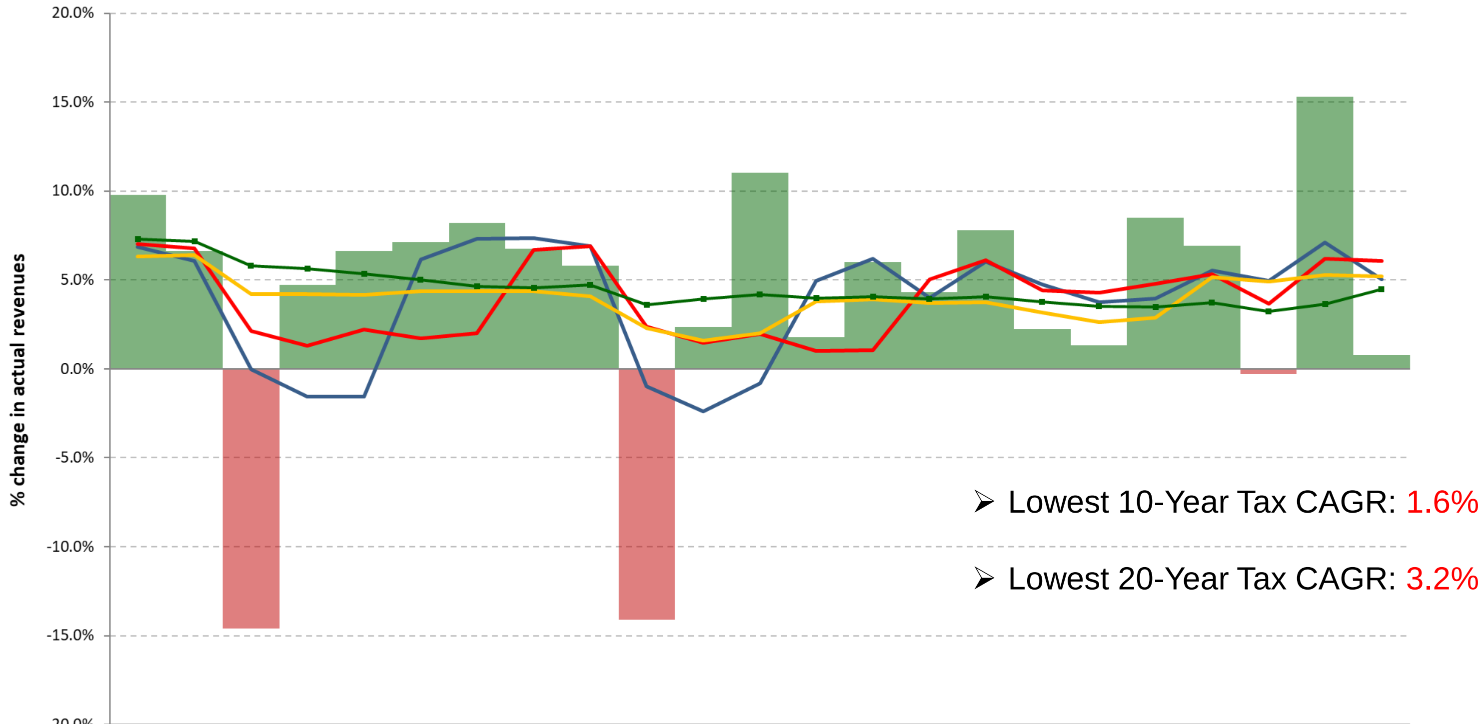
Interest Rates: Historic Yield Curve



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Moody's A 20yr Muni	4.54	4.65	4.54	5.02	5.05	4.25	4.97	3.84	4.68	3.91	3.96	3.03	3.51	3.76	2.84	2.21	2.21	3.78	4.31	4.67	4.90	5.08	5.12	5.11	5.09	5.05	5.02	5.01	5.00
Moody's Aa 20yr Muni	4.37	4.37	4.36	4.60	4.38	3.76	4.28	3.30	4.59	3.50	3.61	2.74	3.20	3.47	2.66	1.97	2.06	3.41	3.94	4.29	4.52	4.69	4.73	4.72	4.69	4.65	4.63	4.62	4.60
Moody's Aaa 20yr Muni	4.28	4.13	4.27	4.50	4.11	3.58	4.01	3.05	3.88	3.28	3.35	2.48	2.97	3.27	2.48	1.76	1.91	3.17	3.70	4.04	4.27	4.43	4.47	4.46	4.43	4.39	4.37	4.36	4.34
IHS Aaa Muni Index	3.90	3.99	4.15	4.39	4.04	3.63	3.75	3.05	4.64	3.61	3.62	2.73	3.17	3.48	2.38	1.67	1.88	1.87	2.07	2.34	2.52	2.67	2.82	2.91	2.94	2.95			
Bond Buyer 20yr Index	4.30	4.43	4.58	4.74	4.52	4.07	4.18	3.75	4.72	4.25	3.77	2.90	3.55	3.97	3.41	2.15	2.13	2.60	2.82	3.00	3.23	3.39	3.65	3.73	3.78	3.80			

Long Term Tax Revenue Growth: CAGR Method

❖ CAGR (Compound Annual Growth Rate) is the geometric average annual growth over a given period. It is generally accepted as an accurate way to compare growth rates over different timelines.



	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22 BM
1-Year Change	9.8%	6.6%	-14.6%	4.7%	6.6%	7.1%	8.2%	6.8%	5.8%	-14.1%	2.4%	11.0%	1.8%	6.0%	4.3%	7.8%	2.2%	1.3%	8.5%	6.9%	-0.3%	15.3%	0.8%
3-Year CAGR	6.8%	6.1%	0.0%	-1.6%	-1.6%	6.1%	7.3%	7.4%	6.9%	-1.0%	-2.4%	-0.8%	5.0%	6.2%	4.0%	6.0%	4.7%	3.7%	4.0%	5.5%	5.0%	7.1%	5.0%
5-Year CAGR	7.0%	6.8%	2.1%	1.3%	2.2%	1.7%	2.0%	6.7%	6.9%	2.4%	1.4%	2.0%	1.0%	1.0%	5.0%	6.1%	4.4%	4.3%	4.8%	5.3%	3.7%	6.2%	6.1%
10-Year CAGR	6.3%	6.4%	4.2%	4.2%	4.2%	4.3%	4.4%	4.4%	4.1%	2.3%	1.6%	2.0%	3.8%	3.9%	3.7%	3.8%	3.2%	2.6%	2.9%	5.2%	4.9%	5.3%	5.2%
20-Year CAGR	7.3%	7.2%	5.8%	5.6%	5.3%	5.0%	4.6%	4.6%	4.7%	3.6%	3.9%	4.2%	4.0%	4.1%	3.9%	4.1%	3.8%	3.5%	3.5%	3.7%	3.2%	3.6%	4.5%

Source: DOR reports on annual revenue. Analysis for DAC purposes only.

5. Credit Factors

Rating Agency Scale Overview

Class	Moody's	S&P	Fitch	Kroll
Prime	Aaa	AAA	AAA	AAA
High Investment Grade	Aa1	AA+	AA+	AA+
	Aa2	AA	AA	AA
	Aa3	AA-	AA-	AA-
Upper Medium Grade	A1	A+	A+	A+
	A2	A	A	A
	A3	A-	A-	A-
Lower Medium Grade	Baa1	BBB+	BBB+	BBB+
	Baa2	BBB	BBB	BBB
	Baa3	BBB-	BBB-	BBB-

MA General Obligation (GO) Long Term Ratings in Green

Commonwealth Ratings Overview

Security	Principal Outstanding (July 31, 2021)	Moody's	S&P	Fitch	Kroll
General Obligation Bonds	$24,765	Aa1	AA	AA+	N/A
Commonwealth Transportation Fund Bonds	$3,192	Aa1	AA+	N/A	AAA
Gas Tax Bonds	$28.4	Aa1	AA+	AA+	N/A
Grant Anticipation Notes	$583	Aa2	AAA	N/A	N/A
Convention Center Bonds	$480	A1	BBB+	N/A	N/A

MA General Obligation (GO) Rating Agency Credit Factor Highlights

Credit Strength Highlights	Credit Offset Highlights

Credit Strength Highlights

- Deep and diverse economy, largely focused on knowledge sectors that pay above average wages.
- High income levels, with per capita income being one of the highest in the nation.
- Exceptional fiscal resilience, with strong gap-closing capacity stemming from a practice of building solid reserve balances and making budget adjustments as needed in response to changing circumstances.
- Strong financial, debt, and budget management policies, including annualized formal debt affordability statements, and multiyear capital investment planning.

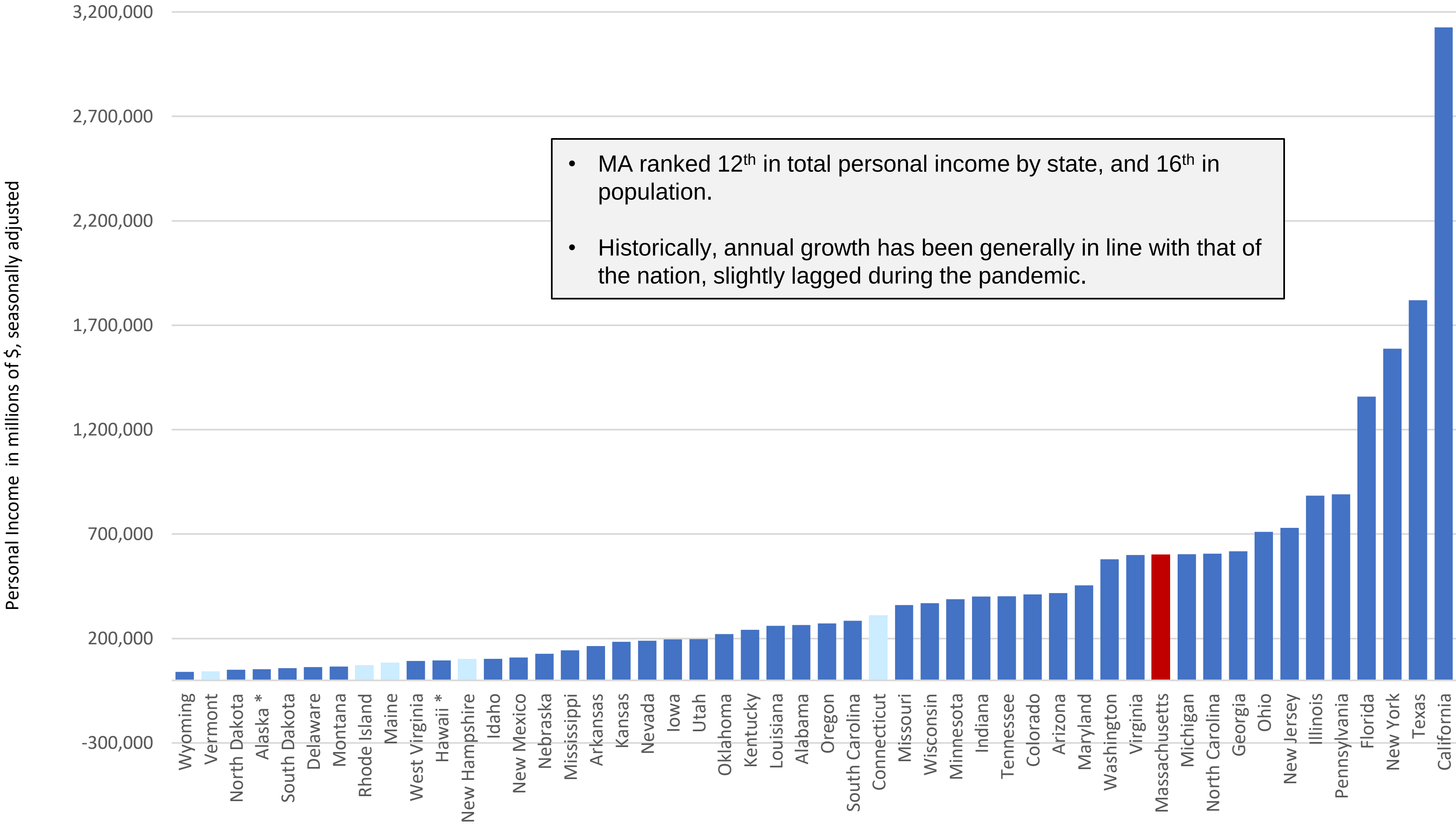
Credit Offset Highlights

- Elevated debt, pension, and other post-employment benefit (OPEB) liabilities relative to other states.
- Aging demographic profile with overall population growth that lags the nation.

MA General Obligation (GO) Rating Agency Highlights

Moody's Aa1 Stable	➢ "The Aa1 rating reflects the commonwealth's robust economic base in good times and its strong management practices to help navigate challenging periods. The commonwealth's credit is bolstered by a highly educated workforce and high income levels that draw employers and help the commonwealth afford its elevated long-term liability burden. Reliance on economically sensitive revenues is balanced by healthy reserves and the ability to access alternate sources of liquidity.." Moody's *Report, September 2021* ➢ "Massachusetts's stable outlook reflects our expectation that the commonwealth will continue its trend of strong financial management as it continues to navigate through the economic impacts of the coronavirus pandemic. Above-forecast revenue performance coupled with substantial federal aid has enabled growth in reserves that are expected to remain at least stable in fiscal 2022." *Moody's Report, September 2021*
S&P AA Stable	➢ "We believe that Massachusetts' economy, with a substantial tech sector presence in the Boston area, has been a bright spot, with a substantial proportion of well-educated workers that were able to work at home during the pandemic and contribute to the state's income tax. *S&P Report, September 2021* ➢ "The stable outlook reflects our view that Massachusetts has had a history of rebuilding its BSF after economic drawdowns and generally conservative budget forecasting, and that the commonwealth's economy will largely track national growth trends in the next two years.." *S&P Report, September 2021*
Fitch AA+ Stable	➢ To date, MA has navigated the economic and fiscal disruptions of the pandemic without materially affecting its strong operating performance and remains well-positioned to continue doing so. Through the pandemic, the state's position has been bolstered by a solidly funded stabilization fund, the commonwealth's budget reserve, and by available federal pandemic aid." *Fitch Report, September 2021* ➢ "The 'AA+' [rating] reflects the Commonwealth's considerable economic resources, adroit management of economic and revenue cyclicality and strong budget controls…[long term debt] liability levels in MA, while comparatively high for a US state are a moderate burden on resources. The Commonwealth's above-average liability position is partly the result of state funding of both capital needs and pensions that are more commonly funded at the local level, primarily for K-12 education." *Fitch Report, September 2021*

Total Personal Income by State (Q1 2021)

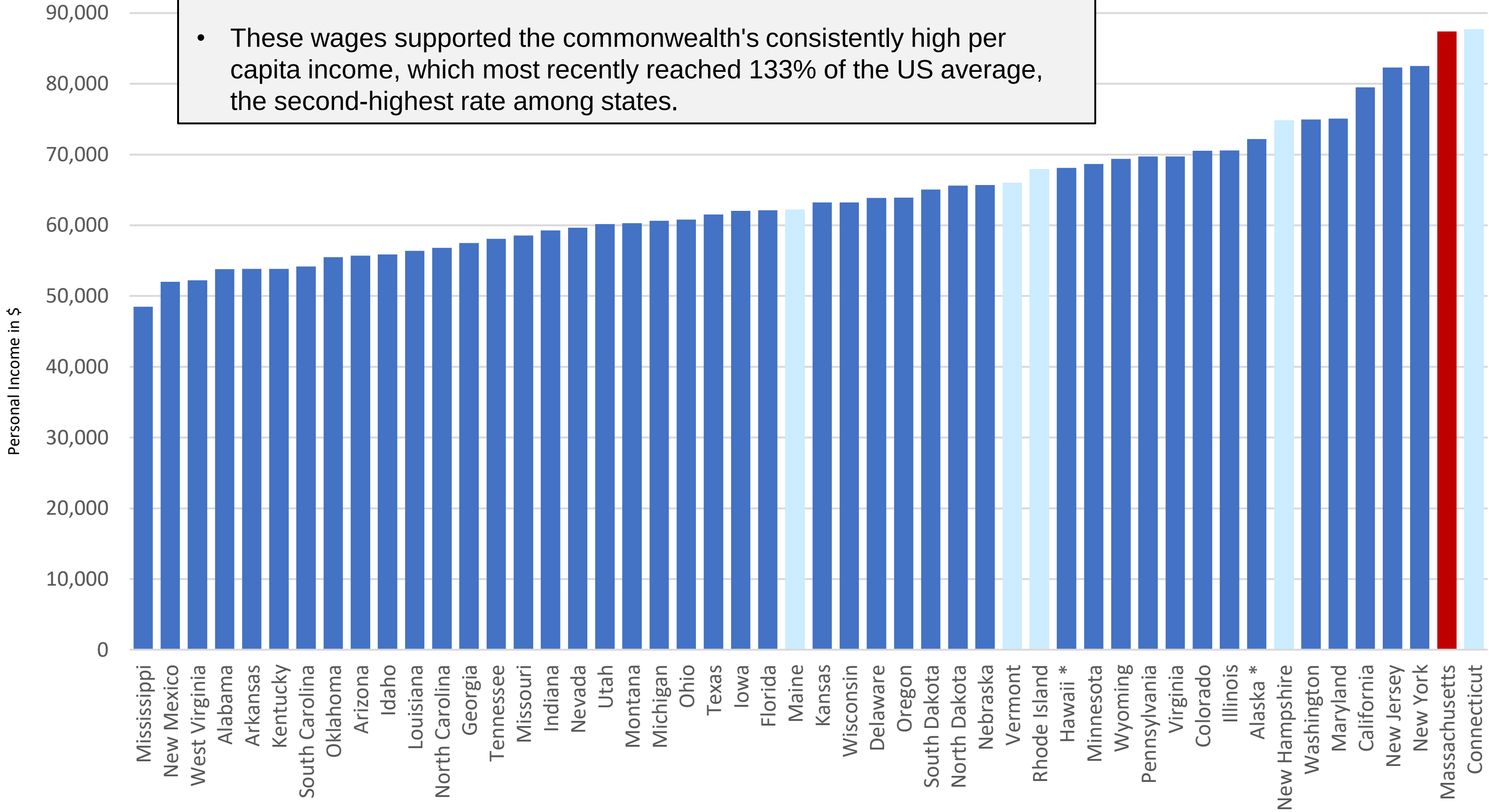


- MA ranked 12th in total personal income by state, and 16th in population.
- Historically, annual growth has been generally in line with that of the nation, slightly lagged during the pandemic.

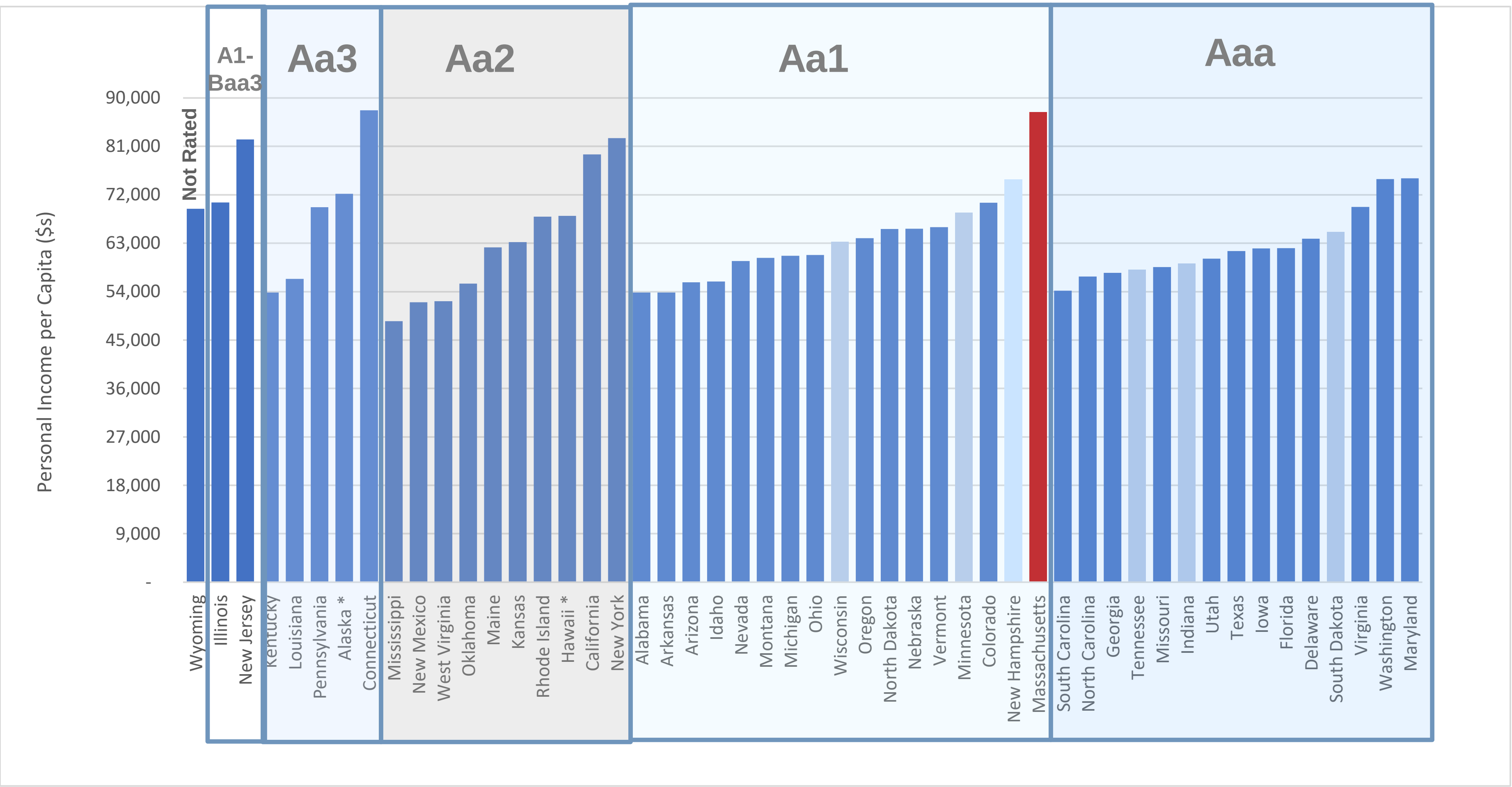
Source: U.S. Bureau of Economic Analysis

Personal Income per Capita by State (Q1 2021)

- MA's economy is supported by a well-trained labor pool, with strong wage growth. Per capita wage growth has typically outpaced the national average.
- These wages supported the commonwealth's consistently high per capita income, which most recently reached 133% of the US average, the second-highest rate among states.



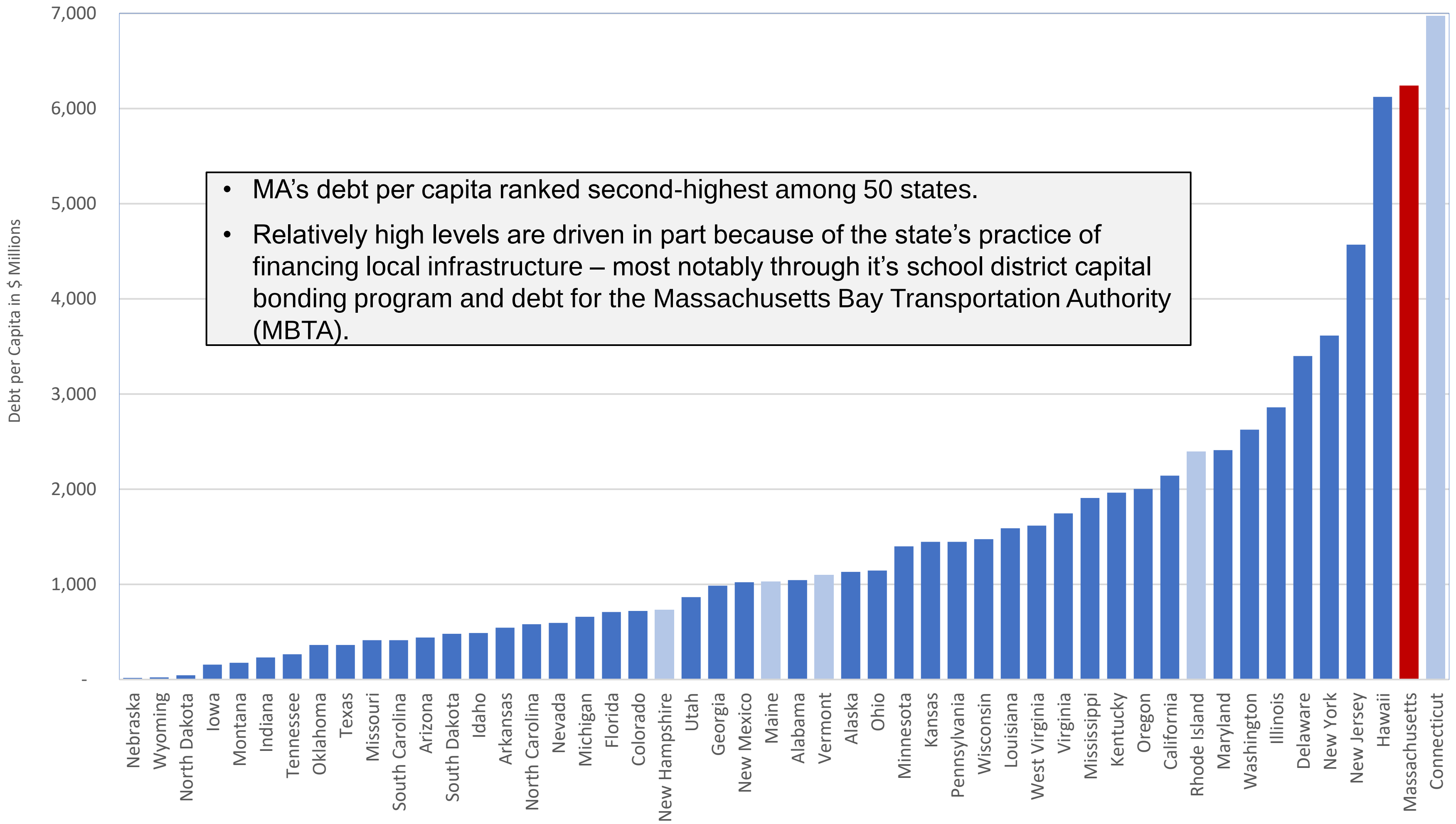
Personal Income per Capita by Rating (Q1 2021)



Sources: Moody’s Investor’s Services

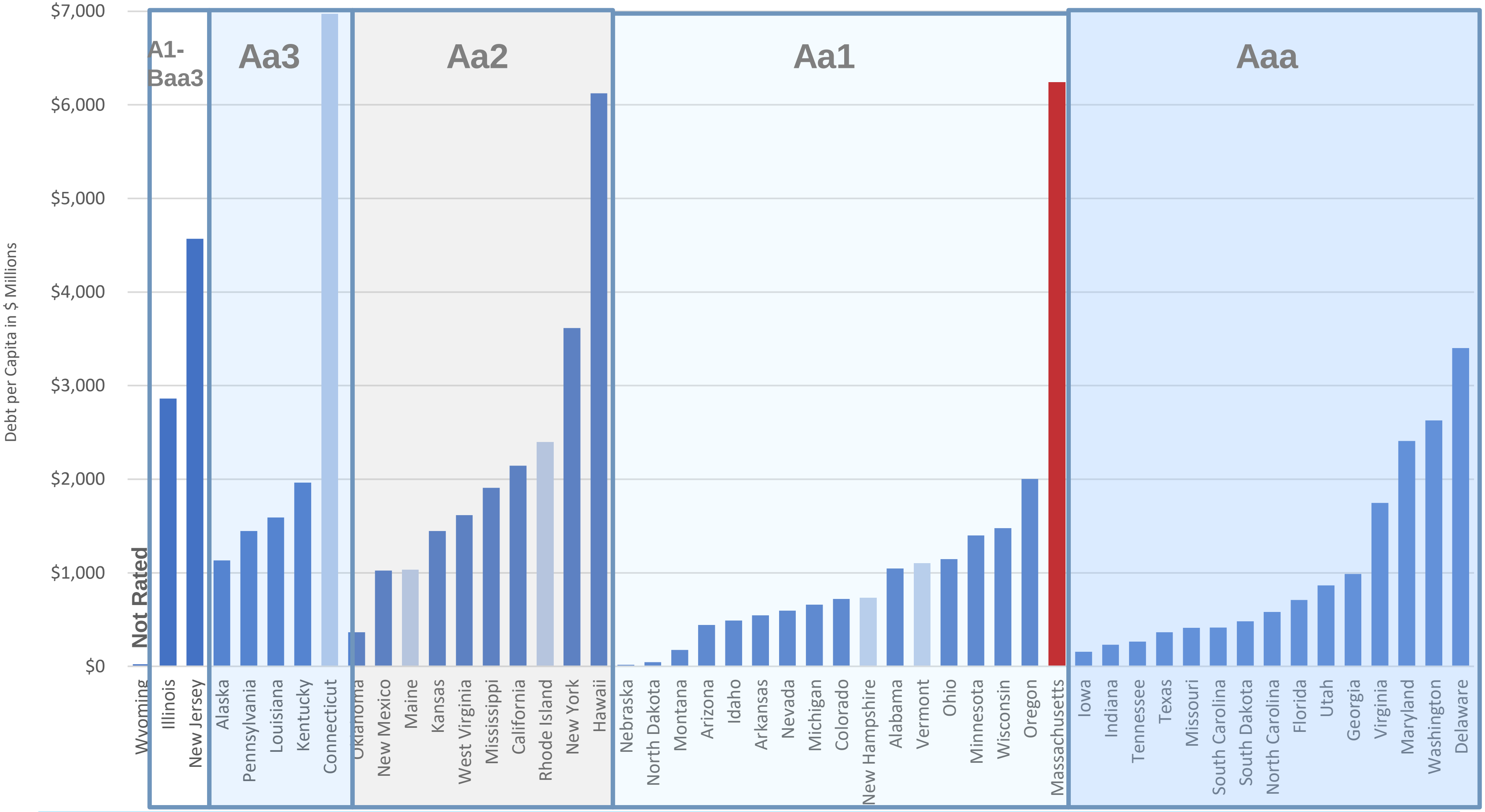
Debt Per Capita by State (2020)

- MA's debt per capita ranked second-highest among 50 states.
- Relatively high levels are driven in part because of the state's practice of financing local infrastructure – most notably through it's school district capital bonding program and debt for the Massachusetts Bay Transportation Authority (MBTA).



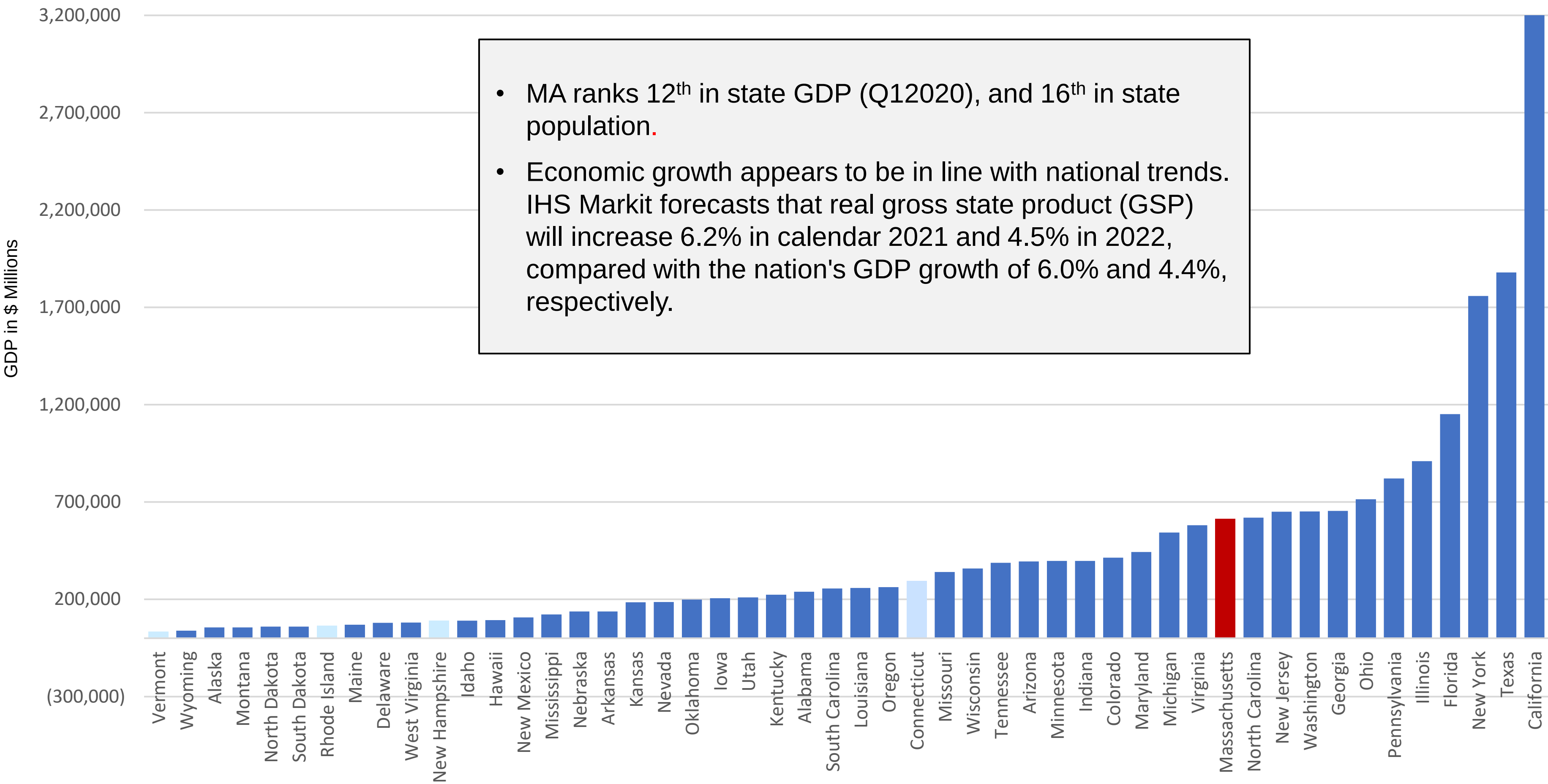
Sources: Moody's Analytics

Debt Per Capita by State and Rating (2020)



Sources: Moody's Analytics

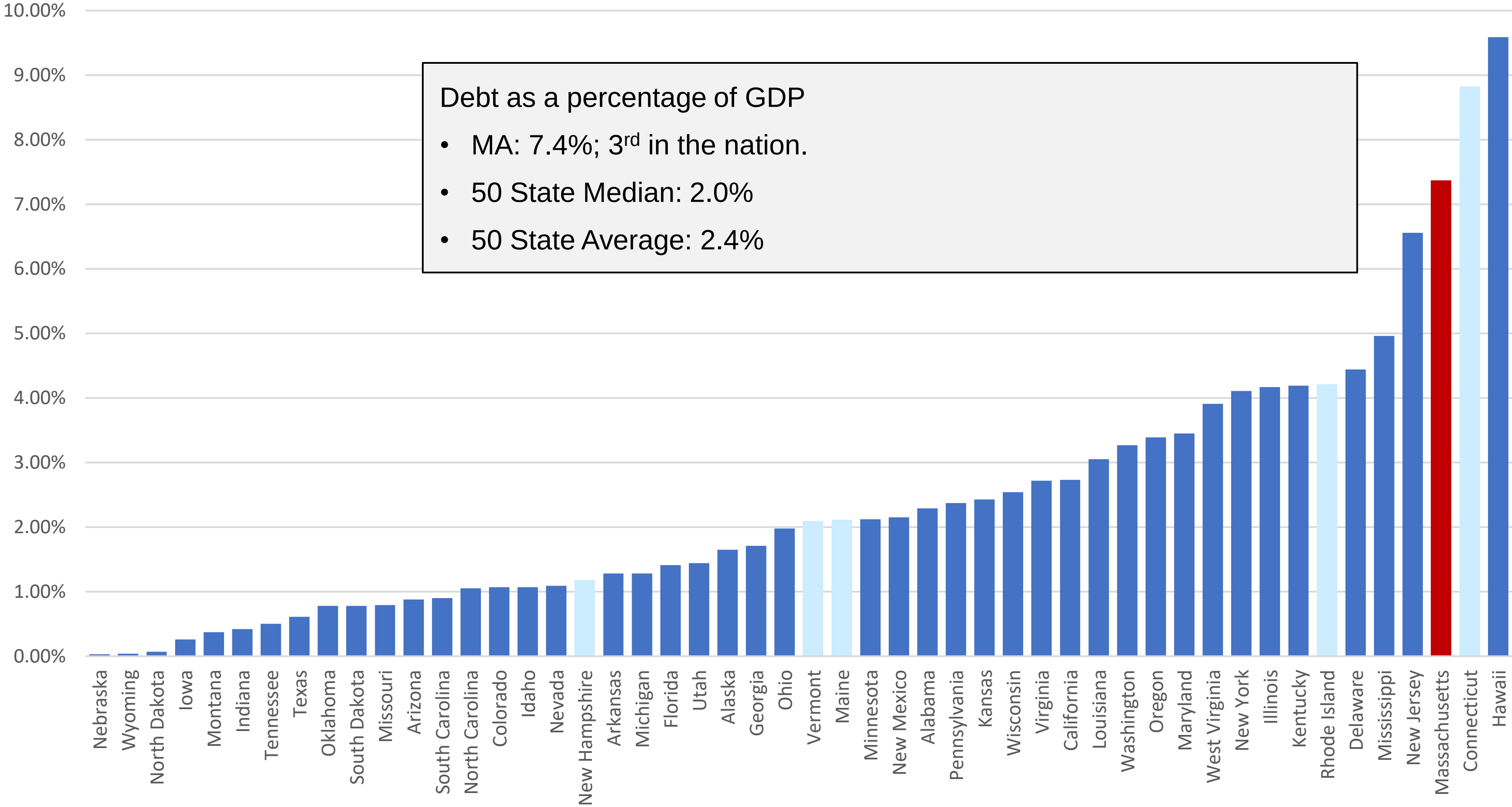
Q1 2021 State Gross Domestic Product (GDP)



- MA ranks 12th in state GDP (Q12020), and 16th in state population.
- Economic growth appears to be in line with national trends. IHS Markit forecasts that real gross state product (GSP) will increase 6.2% in calendar 2021 and 4.5% in 2022, compared with the nation's GDP growth of 6.0% and 4.4%, respectively.

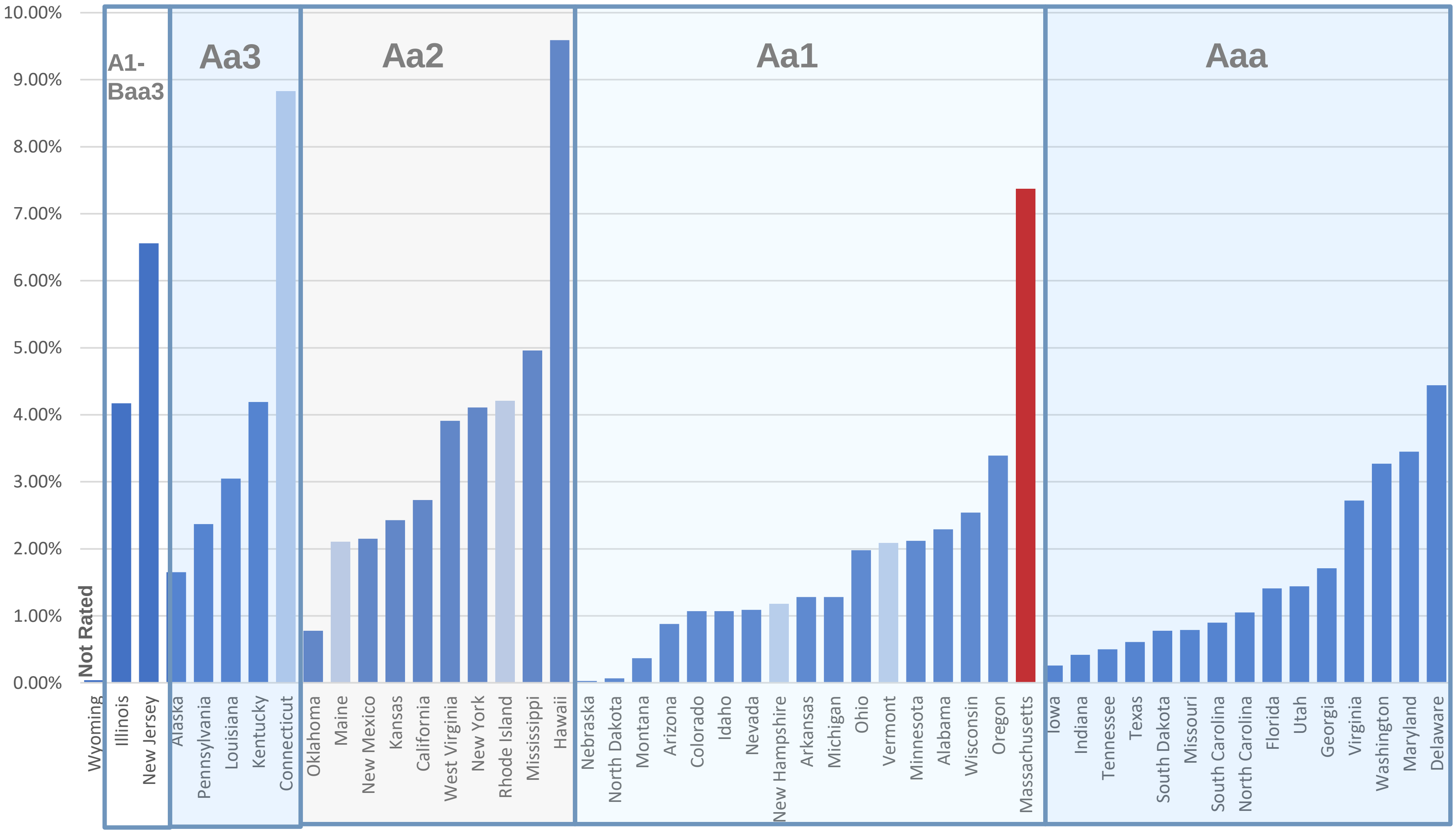
Sources: U.S. Bureau of Economic Analysis;

Debt as a Percentage of State GDP (2020)



Sources: Moody’s Analytics

Debt as a Percentage of State GDP by Rating (2020)



Sources: Moody's Analytics

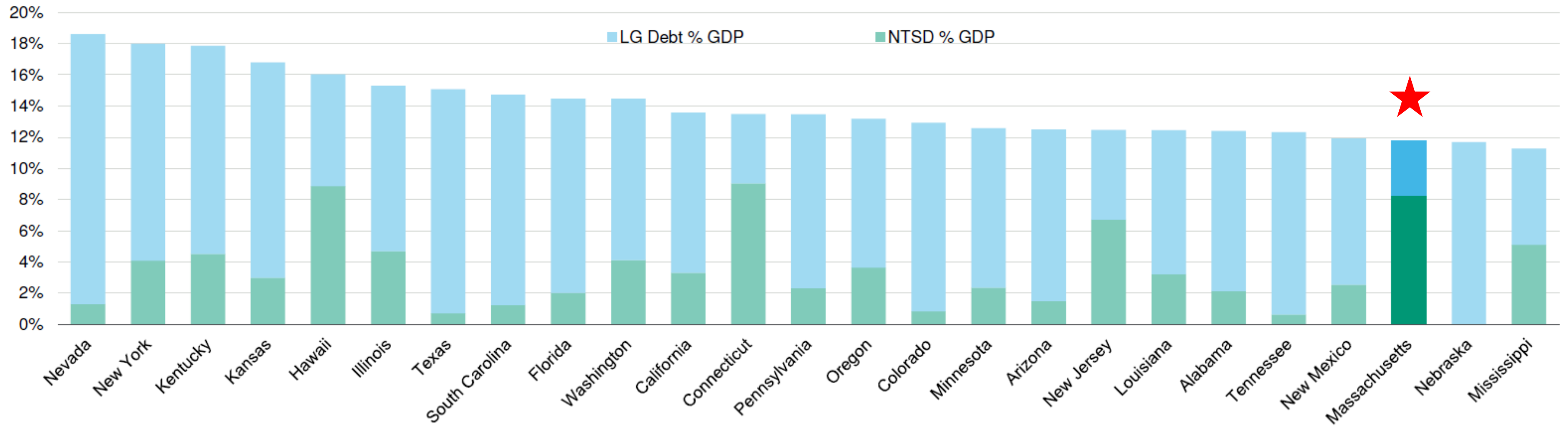
Moody's: Combined state and local government debt burden in line with peers

- When factoring in debt issued by local governments MA's leverage is more moderate. State and local debt represents 11.8% of MA's GDP, ranking the state 23rd and approximating the sector median of 11.2%.

- Debt levels are supported by strong economic fundamentals. Since 2000, economic growth has been stronger than the national average, with much of MA's recent growth in the professional, scientific, and technical services sector which tend to have higher paying jobs. The high technology sector is estimated to make up 10% of state employment, compared with 6.5% to the nation, as a whole.

Massachusetts' total state and local government debt burden more in line with peers

State NTSD + local government debt as a % of GDP

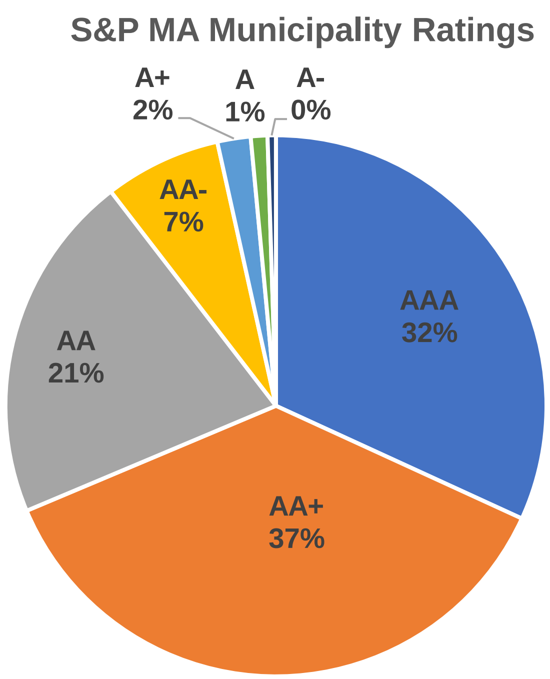


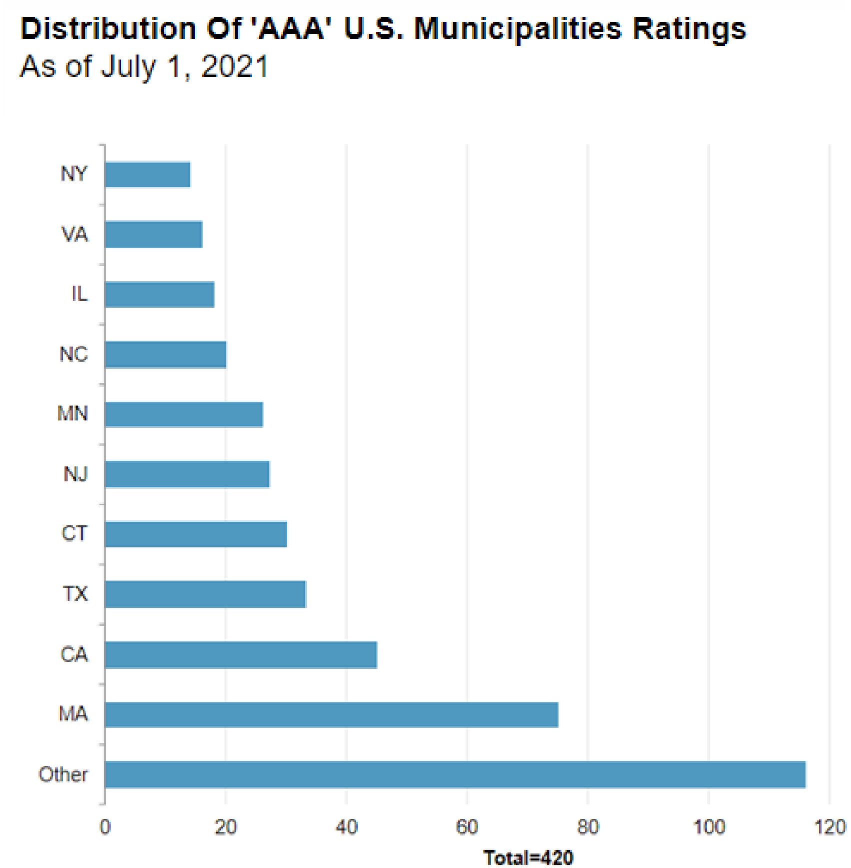
*State NTSD debt data as of fiscal 2017 as reported by Moody's; Local Government debt data as of fiscal 2016 as reported by US Census; GDP data as of 2016

Source: State NTSD data from Moody's Investors Service; Local Government debt data from US Census; GDP from US Bureau of Economic Analysis

Source: Moody's, May 10, 2018

Municipality Credits in Massachusetts





- Massachusetts remains among the states with the most AAA rated local governments

- ~88% of municipalities are estimated to participate in a broad and diverse Metropolitan Statistical Area (MSA), which helps provide economic resiliency through changing economic and business cycles.

Source: S&P Global

6. Commonwealth Debt Overview

Commonwealth Debt Overview

Debt Type	Revenue Pledged	Description	Included in Debt Limit Calculation	Included in DAC Debt Affordability Analysis?
General Obligation (GO) Debt	Debt that can be repaid with all available Commonwealth revenues	Primarily used to fund the Commonwealth's Capital Improvement Plan (CIP). Also supports the UPlan Prepaid College Tuition Program	YES	YES
Special Obligation Debt	Debt repaid from specific pledged revenues: • Commonwealth Transportation Fund (CTF) • Gas tax revenues • Convention Center Fund (CCF)	• CTF funds the Accelerated Bridge Program (ABP) and Rail Enhancement Program (REP) bonds. • Gas tax supported highway construction projects. • CCF funded convention centers in Boston, Springfield and Worcester.	NO YES YES	YES YES YES
Federal Highway Grant Anticipation Notes ("GANs")	Debt paid by Federal Highway Reimbursements	Funds the Accelerated Bridge Program (ABP) and prior transportation program debt service.	NO	YES

Commonwealth Outstanding Debt

Commonwealth Debt ($ in millions)	FY21 Outstanding Debt	FY22 Projected Debt Service*
General Obligation (GO)	$24,765.4	$1,959,6
Special Obligation (SO)	3,700.5	255.2
Federal Grant Anticipation Notes (GANS)	582.6	85.12
Total	**$29,048.5**	**$2,299.9**

** Subject to change*

Outstanding GO Debt

- Outstanding Debt: $24.8 billion
- Fixed Rate Debt: $23.2 billion (94%)
- Variable Rate Debt: $1.5 billion (6%)

Commonwealth Debt Related Obligations

Debt Type	Revenue Pledged	Description	Included in Direct Debt Limit Calculation?	Included in Debt Affordability Analysis?
GO Contract Assistance	Debt related payments by the Commonwealth to: • MA Clean Water Trust • MassDOT • MassDevelopment • Social Innovation Financing Trust Fund	Payments are used by these agencies to fund: • A portion of the debt service on certain outstanding bonds • Social Innovation Financing Trust Fund's "Pay for Success" contracts	No	Yes
Contingent Liabilities	Debt obligations of certain independent authorities and agencies of the Commonwealth that are expected to be paid without Commonwealth assistance, but for which the Commonwealth has some liability if expected payment sources do not materialize.	Agencies in which the Commonwealth's credit has been pledged include: • MBTA • MassDevelopment • Steamship Authority • Regional Transit Authorities • UMass Building Authority	No	No

General Obligation Contract Assistance Requirements

Commonwealth Contract Assistance ($ in millions)	Contract Assistance End Date	FY 22 Payment
MassDOT (1)	2050	$125.0
MA Clean Water Trust	2051	63.4
MassDevelopment	2050	10.6
Social Innovation Financing Trust	2023	0.8
Total		**$199.8**

(1) Represents $25 million per year for fiscal years 2027 to 2050, inclusive, and $100 million per year for fiscal years 2027 to 2039, inclusive.

SOURCE: Commonwealth Information Statement, August 27, 2021, as supplemented November 1, 2021

Commonwealth Contingent Liabilities

Commonwealth Contingent Liabilities	Description	Outstanding Debt*
Mass. Bay Transportation Authority (MBTA)	MA is contingently liable for MBTA bonds and notes, as well as other MBTA payment obligations issued or entered into prior to July 1, 2000. Because the Commonwealth has agreed to pay 90% of the debt service on these bonds (via contract assistance); the remaining 10% of these bonds represents the contingent liability. Outstanding bonds are scheduled to mature annually through 2030.	$121.2
UMass Building Authority (UMBA)	UMBA is authorized to have up to $200 million in Commonwealth-guaranteed debt. In addition to guaranty, bonds are secured by certain UMBA revenues including dormitory rental income and student fees.	-
Regional Transit Authorities (RTAs)	The Commonwealth has 15 RTAs that provide fixed route and paratransit service in communities across the state. MA is subject to a guaranty pursuant to statutory provisions requiring the MA to provide an RTA with funds sufficient to meet the principal and interest on its revenue anticipation notes as they mature to the extent that funds sufficient for this purpose are not otherwise available.	n/a
Steamship Authority	MA is subject to a guaranty pursuant to statutory provisions requiring MA to provide the Steamship Authority with funds sufficient to meet the principal of and interest on their bonds and notes as they mature to the extent that funds sufficient for this purpose are not otherwise available.	$73.2
MassDevelopment	MA is contingently liable to meet debt service reserve and debt service payment requirements for MassDevelopment bonds issued to fund nonprofit hospital and health centers. No such bonds have been issued to date.	-

- *As of July 31, 2021*
- Contingent liabilities relate to debt of certain independent authorities and agencies that are expected to be paid without Commonwealth assistance, but for which the Commonwealth has some kind of liability if expected payment sources do not materialize. <u>At this time there is no expectation that the Commonwealth will be required to provide such assistance.</u>

SOURCE: Commonwealth Information Statement, August 27, 2021, as supplemented November 1, 2021