Commonwealth of Massachusetts

Executive Office for
Administration and Finance

Debt Affordability Committee (DAC)

FY26 Bond Cap Recommendation

December 13, 2024

Debt Affordability Committee | Table of Contents

1. INTRODUCTION

Debt Affordability Committee | Overview and Charge

Committee was created in 2012 to review existing Massachusetts debt and advise on issuance of new debt.

Statutory Charge	Capital Debt Affordability Committee (DAC) was established for the purposes of **reviewing the amount and condition of the state's tax-supported debt**, as well as the debt of certain state authorities. DAC was created by Chapter 165 of the Acts of 2012, and codified in M.G.L. Ch. 29, Sec. 60B.
Responsibilities	DAC is responsible for providing an estimate of the total amount of new capital spending supported by general obligation debt ("bond cap") that can prudently be issued by Massachusetts for the next fiscal year, considering certain criteria. • The estimate is reported by DAC to the Governor and Legislature on or before December 15. • Estimates are advisory and not binding on the Governor or the Legislature.
Committee Membership	Committee consists of **seven voting members**, including the Secretary of Administration and Finance (who chairs), the State Treasurer, the Comptroller, the Secretary of Transportation, one appointee of the Governor and two appointees of the State Treasurer. 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.

Debt Affordability Committee | Debt Limits & Administrative Policies

To inform its recommendation, the DAC considers statutory debt limits and DAC policies, as well as other criteria.

While the Committee's recommendation is for the upcoming fiscal year (fiscal year 2026), the Committee takes a long-term approach to its analysis and considers future debt issuances over a 30-year time horizon. While the Committee looks at the projected impact of its recommendation for 30 years, due to the uncertainty of long-term assumptions regarding tax revenues and interest rates in the municipal market the Committee's focus is largely on the next 10 years.

Massachusetts has a legally binding statutory outstanding Debt Limit

Statutory Debt Limit

The amount of outstanding principal of Commonwealth "direct" debt is capped at **105%** of the previous fiscal year's limit

- FY24 Limit: $30.7 billion
- FY25 Limit: $32.2 billion
- FY26 Limit: $33.8 billion

The DAC targets a bond cap recommendation that, when modeled, results in direct debt remaining below the direct debt limit over the next decade, assuming reasonable future bond cap growth, economic conditions, and debt structuring assumptions

DAC has traditionally followed additional policies adopted by A&F and the Committee:

Administrative Policies

Annual Borrowing Limit: Annual Debt Service Payments < **8%** of budgeted revenues

- FY23 Limit: $4.9 billion
- FY24 Limit: $4.9 billion
- FY25 Limit: $5.0 billion

The DAC targets a bond cap recommendation that, when modeled, results in debt service remaining below 7% of budgeted revenues over the next decade, assuming reasonable future bond cap growth, economic conditions, and debt structuring assumptions

Other DAC Considerations

- Capital Plan Spending
- Credit Ratings
- Debt ratio analysis
- Comparison to other states
- Type of debt outstanding (fixed, variable, hedged debt)
- Other Commonwealth tax supported debt
- Construction escalation

Debt Affordability Committee | Recommendation Work Plan

From Oct to Dec, the Committee met 7 times to review data and analysis used to inform its FY 26 Recommendation. Below is an overview of the DAC work plan

Meeting #	Meeting Date	Topics Covered
1	Oct 11	• DAC Overview • MA Debt Portfolio Overview • Credit Factors Review
2	Oct 25	• Revenue Update • Commonwealth CIP Overview • Model Refresh Update
3	Nov 8	• DAC Model Update & Review
4	Nov 22	• DAC Model Update & Review (cont.) • Prelim Debt Affordability Analysis • Debt Affordability Policy Review & Refresh
5	Dec 4	• DAC Model Update & Review Discussion (cont.)
6	Dec 6	• DAC Model Update & Review (cont.) • Debt Affordability Analysis (cont.) • Debt Affordability Policy Review & Refresh (cont.)
7	Dec 13	• Debt Affordability Analysis and Review (cont.) • FY26 Recommendation Approval

Debt Affordability Committee | Key Findings

Key Findings Summary

- **Credit Ratings:** The Commonwealth's general obligation (GO) credit rating is strong (Aa1/AA+/AA+), supported by a robust and diverse economy, high income levels and a history of strong financial management. Relatively high debt levels compared to other states is the biggest credit offset, however state investment in local communities is a driver of these relatively elevated levels. Unlike many other state GO credits, the Commonwealth issues debt for both state and local level purposes.

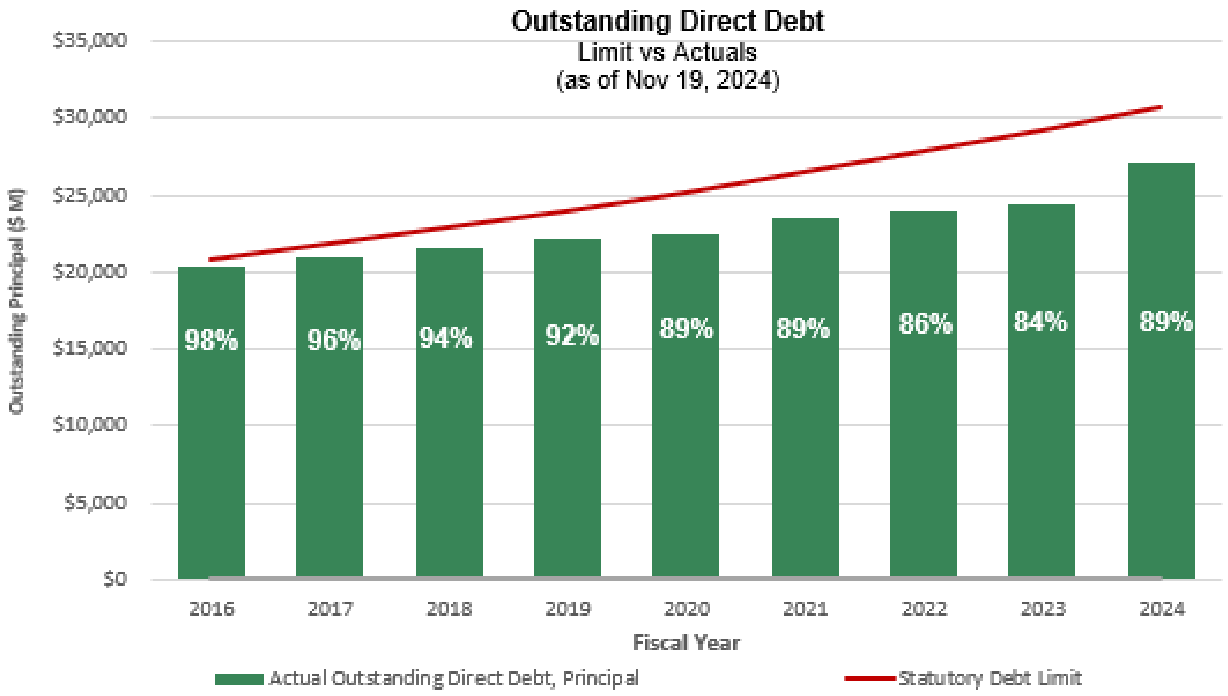
- **Debt Service Affordability:** Debt service as a percentage of revenues is approximately 4% - well below the Committee's targeted affordability limits. The Committee found that debt service as a % of revenues remains within policy limits in all modeling scenarios except the revenue "stress test" scenario, which shows debt service exceeding the revenue limit sometime within in 2047–2049. However, this is well outside the 10-yr window that the DAC tends to focus on.

- **Direct Debt Limit:** The Committee views the statutory direct debt limit as the most constraining factor in its affordability analysis. At the end of fiscal year 2024 current outstanding direct debt was 89% of the current statutory direct debt limit, however this buffer is expected to decrease in the coming years as the bond cap continues to grow. Modeling suggests outstanding direct debt will hover around 99% from 2031 – 2037, assuming reasonable assumptions around future bond cap growth and economic conditions.

- **Construction cost escalation:** Construction cost escalation, which has been historically high, is something the Committee continues to monitor. The Committee notes that construction escalation has outpaced CIP growth in recent years, and while construction escalation has somewhat cooled, it still remains a capital challenge and will likely continue to erode the CIP's purchasing power. We note that this erosion is likely to be further compounded given bond cap growth will be constrained by the direct debt limit.

Debt Affordability Committee | Key Findings (cont.)

At the end of FY24 MA current outstanding debt was 89% of the current limit, however buffer will decrease if net bond cap growth outpaces direct debt limit. DAC modeling suggests that the direct debt limit is the constraining factor to consider for this year's recommendation.



Debt Limit Recap

- The direct debt limit increases by 5% each fiscal year (per statute)
- Buffer between the statutory limit and actual outstanding debt is a function of annual net new principal *(new principal issued – principal being paid off)* vs direct debt limit growth (5% YoY)
- Amount of new principal is a function of actual capital spending *(annual bond cap budget is presumed capital spending)*
- Model inputs that impact direct debt forecasting:
  - Future Bond Cap Growth
  - Premium = bonds proceeds for capital spending above par amount therefore it doesn't count towards direct debt limit.
  - NOTE: Interest rate and revenue growth assumptions have no bearing on direct debt forecasting

2. FY 2026 Advisory Bond Cap Recommendation

Fiscal Year 2026 DAC recommended bond cap*: *$3.227 billion.*

Voted December 13, 2024:

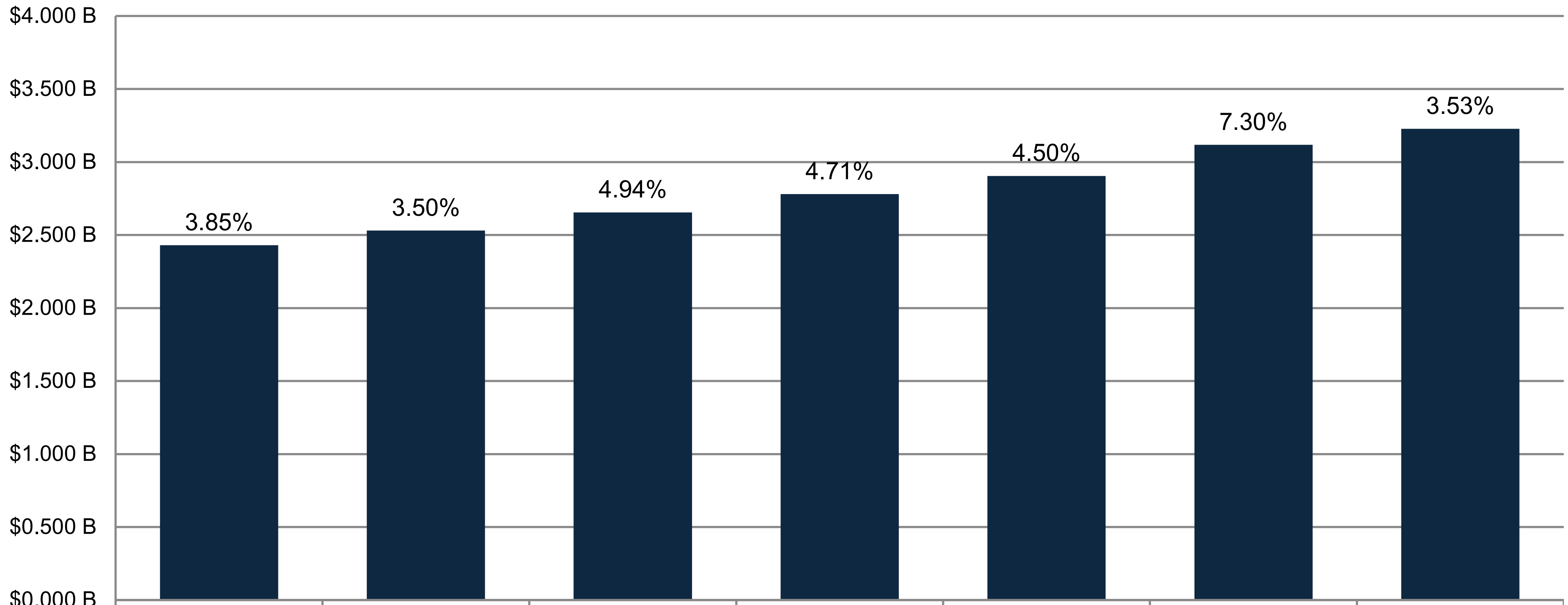
To recommend to the Governor a bond cap increase of $110 million for fiscal year 2026, resulting in a recommended bond cap amount of $3,227,200,000 for fiscal year 2026, and to make the slide deck report with modeling publicly available online.

**Bond cap refers to the total amount of new capital spending supported by general obligation debt.*

Debt Affordability Committee | DAC Historic Recommendations

FY 2026 Bond Cap Recommendation: *$3.227 billion, which is a 3.5% increase over prior year's bond cap.*

Average annual Bond Cap growth over the past decade: *4.2%*



	FY20	FY21	FY22	FY23	FY24	FY25	FY26
Increase to Bond Cap	$0.090 B	$0.100 B	$0.125 B	$0.125 B	$0.125 B	$0.212 B	$0.110 B
Annual Cap Growth (%)	3.85%	3.50%	4.94%	4.71%	4.50%	7.30%	3.53%
■ Recommended Bond Cap	$2.430 B	$2.530 B	$2.655 B	$2.780 B	$2.905 B	$3.117 B	$3.227 B

DAC Affordability Modeling | Model Overview

To assess overall affordability, the DAC uses a model it developed in-house to project both outstanding direct debt and debt service payments under various modeling scenarios.

This year the DAC worked with financial advisors PFM to update the model, resulting in a more refined and sophisticated tool. Details on the model update and modelling analysis can be found be found in the " *3. Debt Affordability Modeling* ***" section of this report. Below is an overview of key model inputs.***

	Model Input	Description	Significant Changes made via Model Update?
Held Constant Across Scenarios	**Debt Service on Existing Debt**	• Debt service schedules for existing debt (GO & Special Obligation (SO) debt)	
	Contract assistance payments	• Projected payment schedules for existing contract assistance agreements	
	Issuance maturity terms for future debt	• Assumed bond maturity distribution across future issuances • Maturity Terms: 1 -10 yrs; 11 – 20 yrs; & 21 – 30yrs)	
	Other debt structuring assumptions for future debt	• Assumed interest only period for future debt • Debt service assumptions for future debt: level debt service vs. level principal	• New feature added to model
	Issuance timing	• Assumed bond issuance timing	• New feature added to model
Adjusted Across Scenarios	**Premium Assumptions**	• Assumed bond premium to be received	• New feature added to model
	Interest rates for new debt	• Assumed interest rates for future debt issuances by maturity term	
	Revenue Growth	• Assumed rate of growth for budgeted revenue	
	FY26 Projected Bond Cap (DAC Recommendation)	• Projected new direct debt issued in FY26	• Includes new "maximization" modeling feature
	Future Bond Cap Growth	• Assumed rate at which the bond cap will grow annually; based on DAC recommendation	• Includes option to grow by constant $ value or % rate

DAC Affordability Modeling | Model Input Assumptions

To reach its recommendation the DAC modeled a number of scenarios. Below is an overview of the assumptions used in the DAC's primary modeling; results of that modeling are shown in following slides *(14 – 21).*

Revenue Growth Rate Assumptions: Maintain CAGR approach from prior year; exclude Fair Share surtax revenue from calculation.

- Moderate: 4.3% avg annual YoY growth
- Conservative: 3.2% annual growth rate (20yr CAGR low)
- Stress Test: 1.6% annual growth rate (10yr CAGR low)

Interest Rate Assumptions: 5% - going with actual coupon typically used given premium is being factored in this modeling

Interest only period?: Yes, 3 years – in line with typical actual structuring

Level principal or Level debt service: Level debt service - in line with typical actual structuring

Premium Assumptions:

- Optimistic: 11.0% - average premium excluding high *(13.1%)* and low *(3.1%)*
- Moderate: 10.0% - *slightly below the average premium, current assumption used for budgeting purposes*
- Conservative: 7.8% - *2023 average (year of lowest premium)*
- Premium Low: *3.1% - recent low*

Bond Issuance Timing Assumptions: 80% of projected fiscal year spending will be bonded for in that fiscal year, the remaining 20% is bonded for at the beginning of the following fiscal year.

- Adjustment needed to ensure the model does not overestimate the amount of debt to be issued
- Aligns with actual issuance cadence given nature of capital spending and Commonwealth's practice of bonding in arrears

DAC Affordability Modeling | Premium Focused Modeling Scenarios

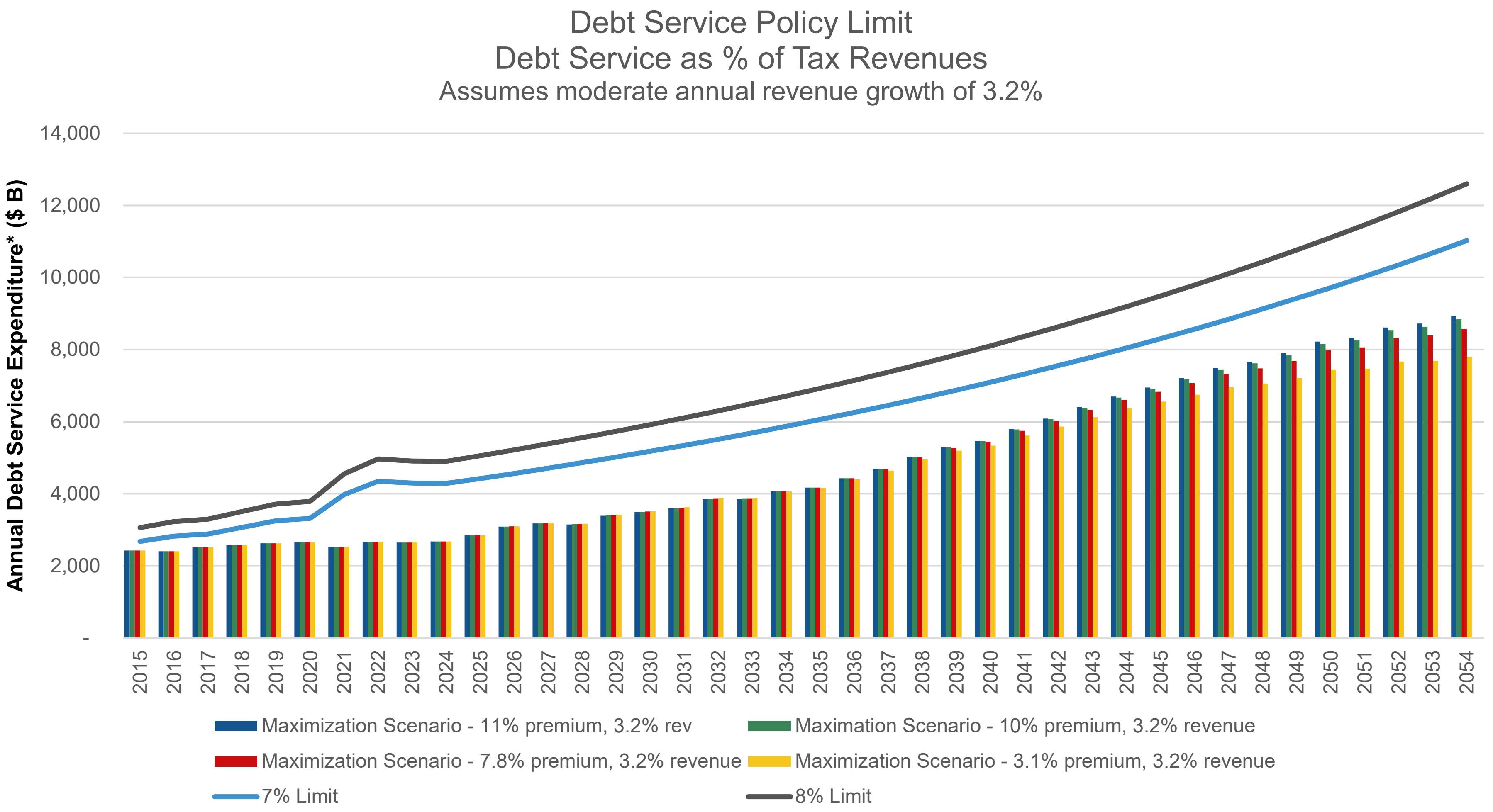
Premium Modeling "Maximization" Comparisons: Estimates for staying within limits assuming 11%, 10%, 7.8%, 3.1% premium scenarios and conservative revenue growth of 3.2% (20-yr CAGR low)

	1	2	3	4
	Maximization Scenario 11% premium,	**Maximization Scenario 10% premium**	**Maximization Scenario 7.8% premium**	**Maximization Scenario 3.1% premium**
Interest Rates	5.00% - 5.00%	5.00% - 5.00%	5.00% - 5.00%	5.00% - 5.00%
Revenue Growth	Conservative: 3.20%	Conservative: 3.20%	Conservative: 3.20%	Conservative: 3.20%
Future Bond Cap Growth	+$114M/yr	+$107M/yr	+$91M/yr	+$48M/yr
Metrics	**Maximization Scenario 11% premium,**	**Maximization Scenario 10% premium**	**Maximization Scenario 7.8% premium**	**Maximization Scenario 3.1% premium**
Borrowing Limit				
10-Year Outlook (8% Cap)	✓	✓	✓	✓
10-Year Outlook (7% Cap)	✓	✓	✓	✓
30-Year Outlook (8% Cap)	✓	✓	✓	✓
Statutory Debt Limit				
105% of Prior Fiscal Year	✓	✓	✓	✓

DAC Affordability Modeling | Premium Modeling Scenarios

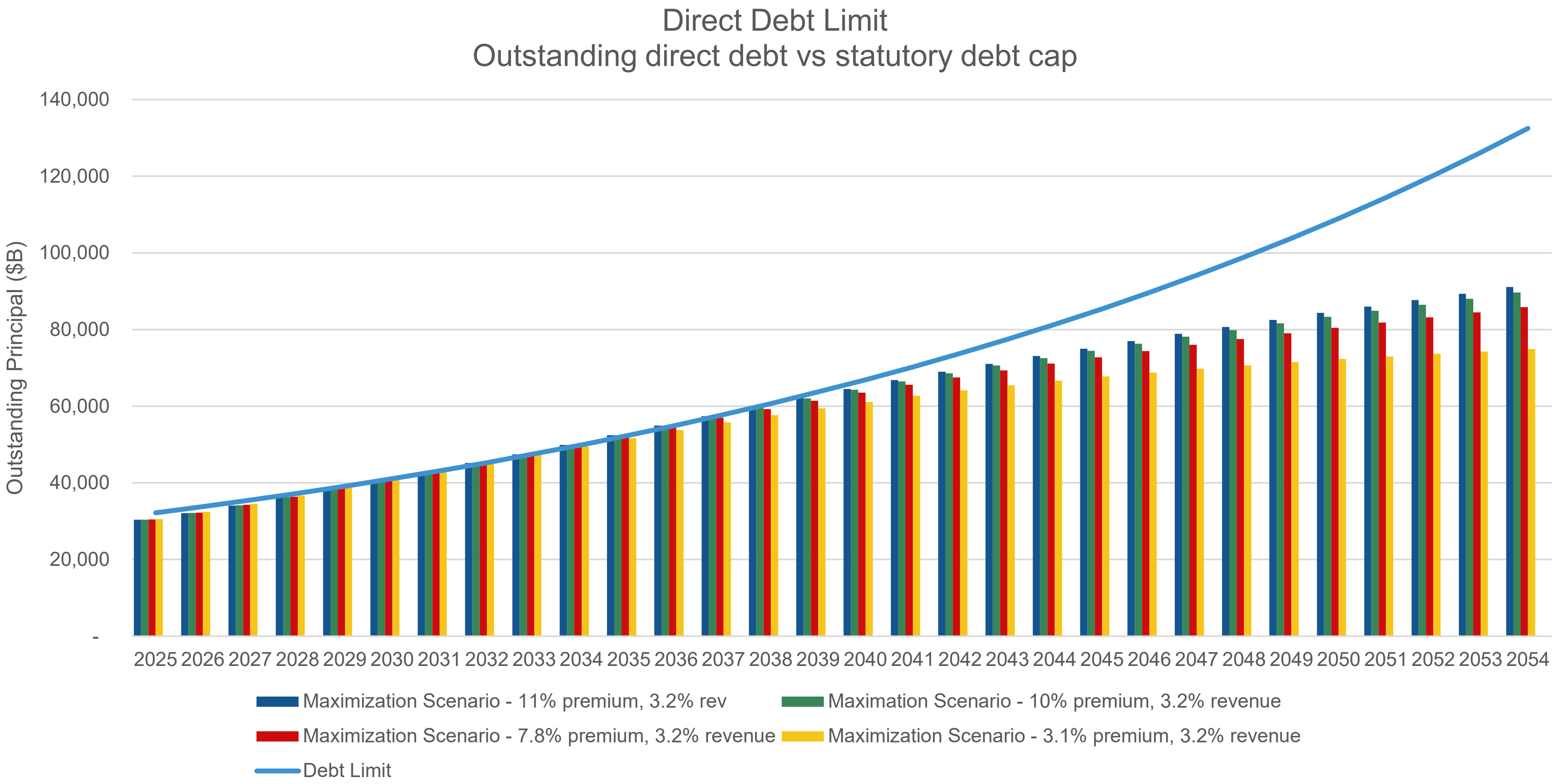
Premium Modeling "Maximization" Comparisons: Estimates for staying within **debt service** limits assuming 11% 10%, 7.8%, 3.1% premium scenarios and conservative revenue growth of 3.2%

Annual debt service expenditures includes GO debt service as well as Special Obligation debt service



DAC Affordability Modeling | Premium Modeling Scenarios

Premium Modeling "Maximization" Comparisons: Estimates for staying within **outstanding direct debt** limits assuming 11% 10%, 7.8%, 3.1% premium scenarios and conservative revenue growth of 3.2%



DAC Affordability Modeling | Premium Focused Modeling Scenarios

Premium Modeling Maximization Comparisons: Modeling assuming 11%, 10.0% & 7.8% premium scenarios and stress test revenue growth of 1.6%

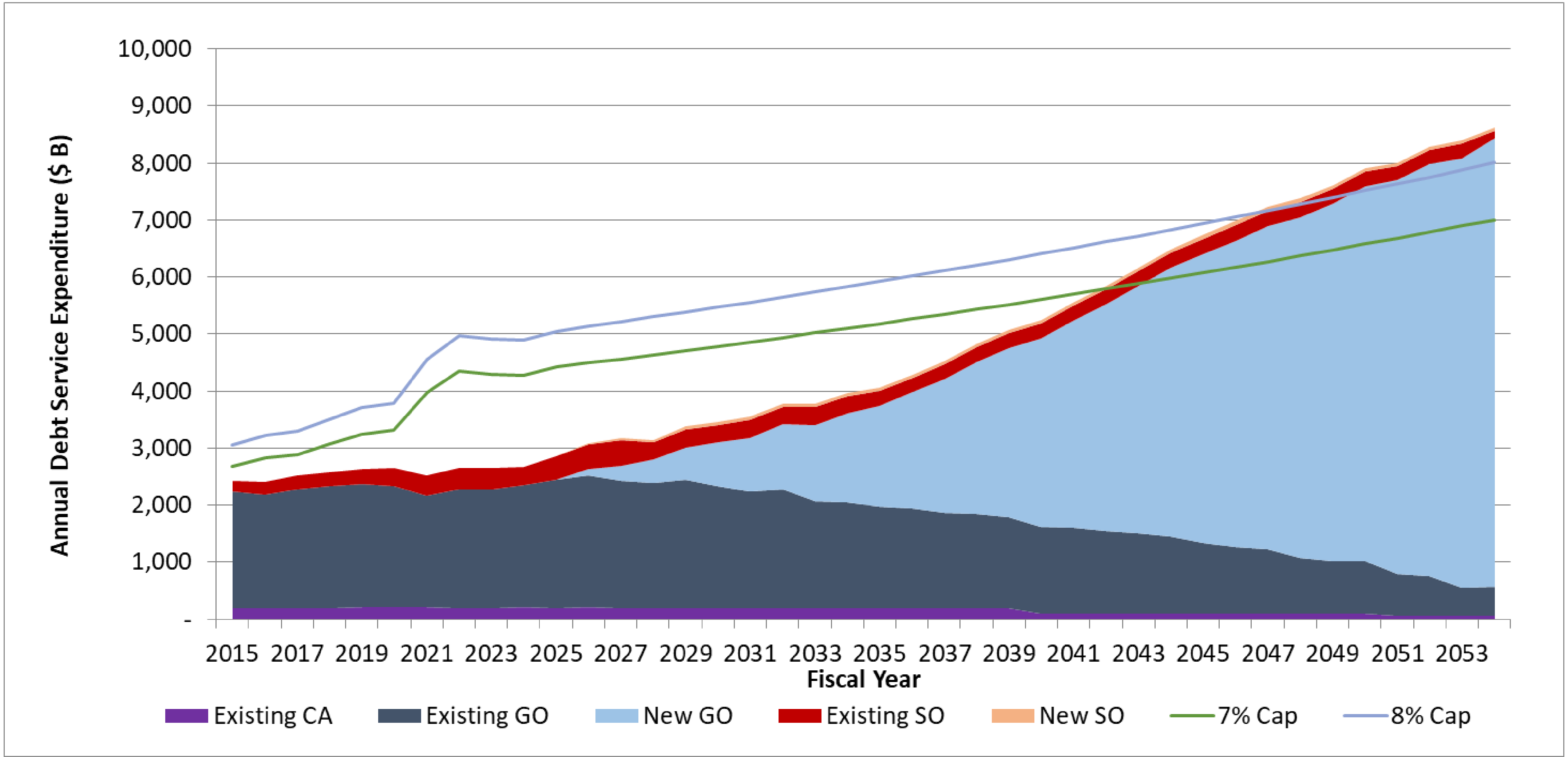
	Maximization Scenario 11% premium	Maximization Scenario 10% premium	Maximization Scenario 7.8% premium
Interest Rates	5.00% - 5.00%	5.00% - 5.00%	5.00% - 5.00%
Revenue Growth	Conservative: 1.60%	Conservative: 1.60%	Conservative: 1.60%
Future Bond Cap Growth	+$114M/yr	+$107M/yr	+$91M/yr

Metrics		Maximization Scenario 10% premium	Maximization Scenario 7.8% premium
Borrowing Limit Metrics			
10-Year Outlook (8% Cap)	✓	✓	✓
10-Year Outlook (7% Cap)	✓	✓	✓
30-Year Outlook (8% Cap)	**X (Breach in 2047)**	**X (Breach in 2047)**	**X (Breach in 2049)**
Statutory Debt Limit			
105% of Prior Fiscal Year	✓	✓	✓

DAC Affordability Modeling | Premium Focused Modeling Scenarios

Projected Debt Service vs Debt Service Policy Limits

Assumes 11.0% premium scenario and stress test revenue growth of 1.6%



Debt Affordability Committee | FY 26 Recommendation Summary

Recommendation Summary

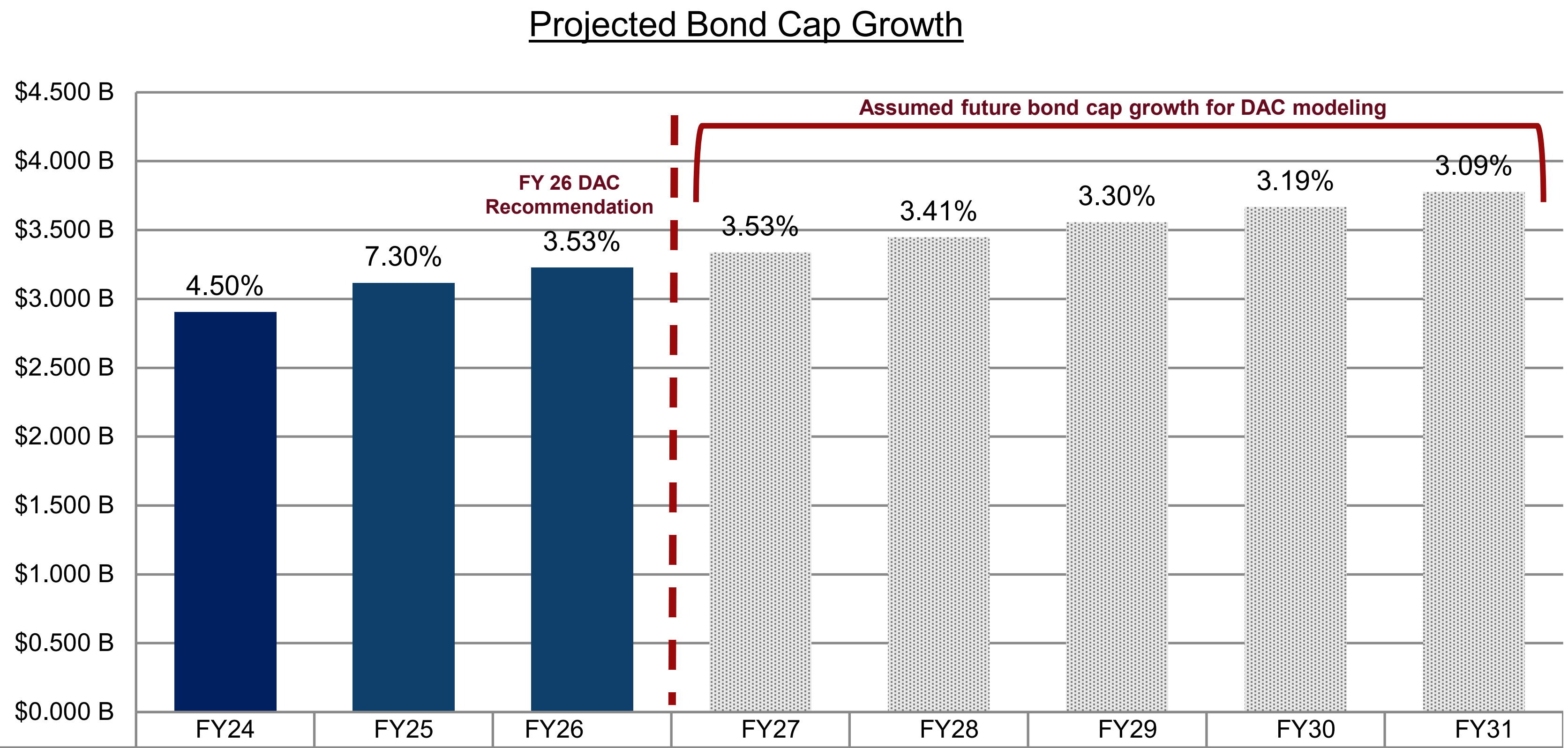
- The Committee's recommendation falls between the 11% and 10% premium "maximization" scenarios, assuming 3.2% revenue growth.
- While the Committee's formal bond cap recommendation is for fiscal year 2026, the Committee's recommendation is based on prudent economic assumptions, as well as prudent assumptions around future bond cap growth.
- Overall, the Committee's analysis suggests an annual year-over-year bond cap growth of $110 million in fiscal years 2026 through 2056 is affordable and sustainable assuming modeling input assumptions remain relatively in line with actuals.
- To arrive at its conclusion, the Committee performed wide range modeling that considered a variety of assumptions and scenarios ranging from moderate to stress test levels.
- While the Committee looks at debt affordability impacts over a thirty-year horizon, it recognizes that modeling uncertainty increases the further out in time it spans. Therefore, the Committee is particularly focused on the upcoming ten-year horizon where there is more certainty, especially in the early years.
- The below table provides the resultant ten-year forecast assuming an annual year-over-year bond cap growth of $110 million, which the Committee's analysis shows is affordable and sustainable assuming its modeling input assumptions remain relatively in line with actuals.

DAC Modeling Projections	FY26 Rec	*Projected*								
	FY26	***FY27***	***FY28***	***FY29***	***FY30***	***FY31***	***FY32***	***FY33***	***FY34***	***FY35***
Bond Cap	$ 3.227	*$ 3.337*	*$ 3.447*	*$ 3.557*	*$ 3.667*	*$ 3.777*	*$ 3.887*	*$ 3.997*	*$ 4.107*	*$ 4.217*
Bond Cap Annual Growth *(steady annual growth)*	0.110	*0.110*	*0.110*	*0.110*	*0.110*	*0.110*	*0.110*	*0.110*	*0.110*	*0.110*
Annual Bond Cap Growth (%)	3.5%	*3.5%*	*3.4%*	*3.3%*	*3.2%*	*3.1%*	*3.0%*	*2.9%*	*2.8%*	*2.8%*
Debt service as % of Revenue *(3.2% growth)*	4.74%	*4.72%*	*4.53%*	*4.71%*	*4.67%*	*4.64%*	*4.80%*	*4.64%*	*4.73%*	*4.68%*
Direct Debt as % of Direct Debt Limit *(11% premium)*	95%	*96%*	*96%*	*97%*	*98%*	*98%*	*99%*	*99%*	*99%*	*99%*

$ in billions

Debt Affordability Committee | FY 26 Recommendation Modeling

Overall, the Committee's analysis suggests an annual year-over-year bond cap growth of $110 million in fiscal years 2026 through 2056 is affordable and sustainable assuming modeling input assumptions remain relatively in line with actuals. Assumed bond cap projections over the following five years is illustrated below.



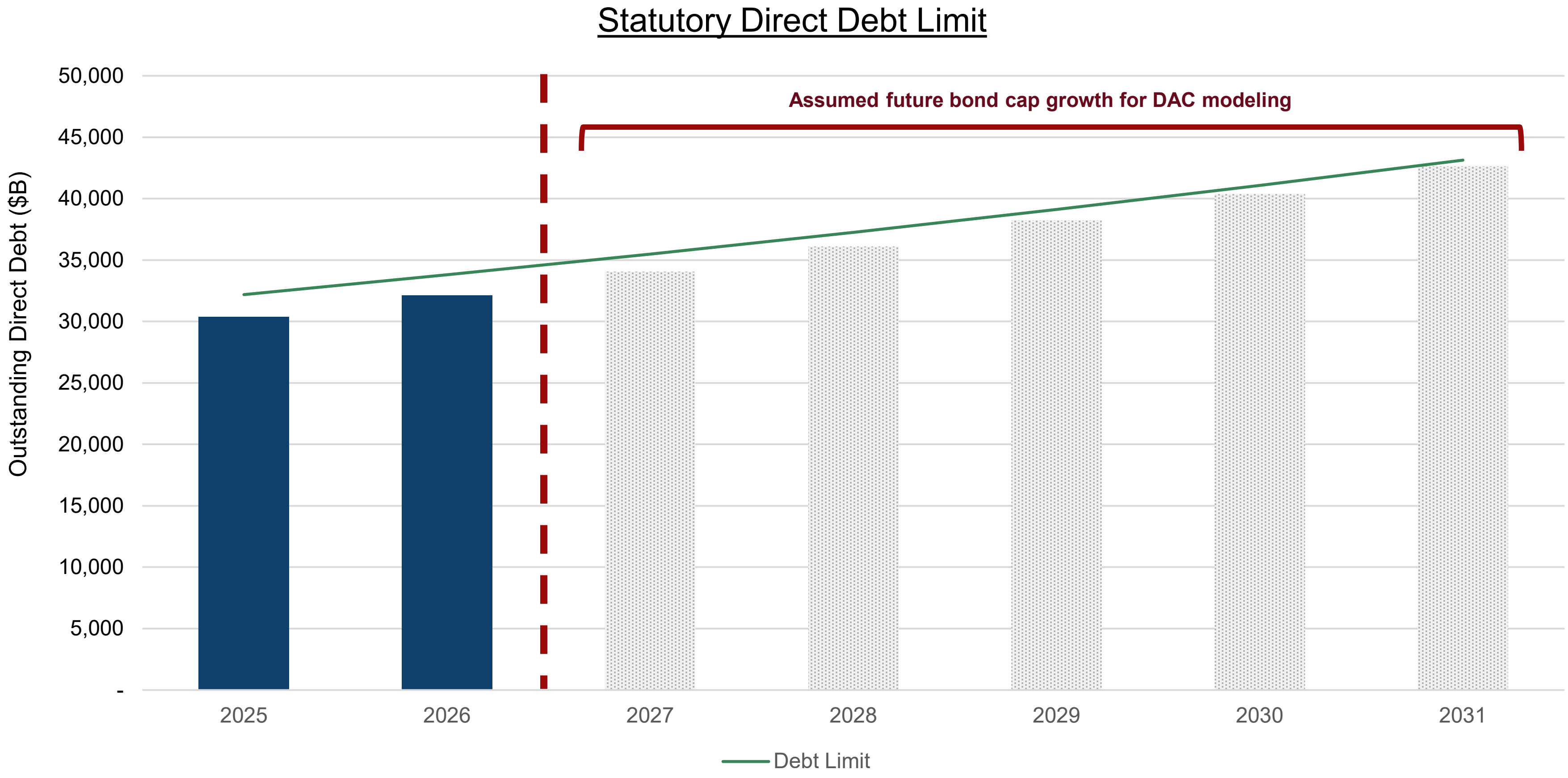
	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31
Increase to Bond Cap	$0.125 B	$0.212 B	$0.110 B	$0.110 B	$0.110 B	$0.110 B	$0.110 B	$0.110 B
Annual Cap Growth (%)	4.50%	7.30%	3.53%	3.53%	3.41%	3.30%	3.19%	3.09%
Recommended Bond Cap	$2.905 B	$3.117 B	$3.227 B	$3.337 B	$3.447 B	$3.557 B	$3.667 B	$3.777 B

DAC modeling assumes bond cap will continue to grow by $110 M annually

Debt Affordability Committee | FY 26 Recommendation Modeling

The Committee views the statutory direct debt limit as the most constraining factor in its affordability analysis. At the end of fiscal year 2024 current outstanding direct debt was 89% of the current statutory direct debt limit, however this buffer is expected to decrease in the coming years as the bond cap continues to grow.

Assuming reasonable assumptions around future bond cap growth and economic conditions, modeling suggests outstanding direct debt will hover around 99% percent of the threshold from 2031 – 2037 before slowly decreasing.



DAC Recommendation Reference Materials

3. Debt Affordability Modeling Update

Debt Affordability Modeling | DAC Model Overview

DAC uses an excel based model originally developed in-house (by A&F staff, with DAC input) to project debt service payments under various scenarios to inform its annual recommendation. The model underwent a major refresh this year. The DAC worked with financial advisors from PFM to improve functionality and refine its modeling.

Updated Model Overview

- Includes annual debt service payments (next 30 yrs) for <u>existing</u> GO, SO, and Contract Assistance (CA) debt out 30 years
    - <u>GO Debt</u>: General Obligation debt that is secured by the Commonwealth's full faith & credit
    - <u>SO Debt</u>: Special Obligation debt that is secured by a specific revenue stream *(e.g. Commonwealth Transportation Fund (CTF) bonds)*
    - <u>Contract Assistance (CA)</u>: statutorily required payments to the MA Clean Water Trust, MassDOT, and MassDevelopment Finance Agency to pay a portion of the debt service on certain outstanding bonds
- Projects annual debt service payments (next 30 yrs) associated with <u>future</u> GO and SO debt under various assumptions/scenarios
- Projects 7% and 8% annual revenue thresholds (next 30 yrs)
- Projects outstanding direct debt (next 30 yrs) associated with <u>future</u> GO and SO debt under various assumptions/scenarios
- Projects future direct debt limit across 30 yrs

Debt Affordability Modeling | DAC Model Highlights

The updated model incorporates a number of new features.

New Features Highlights

- Incorporates outstanding direct debt to statutory direct debt limit modeling (formerly done outside of the original model and with less precision)
- Refines the approach to structure future debt; enables the user to align structuring assumptions with actual Commonwealth practices
- Includes "maximize" feature, which has the model calculate the max amount of new debt that could be issued, while staying under statutory and policy limits given certain assumptions
- Includes new enhanced dashboards and charts
- Includes new scenario comparison feature that graphically compares different scenarios
- Automates data upload and decreases manual processes

Fiscal Year Start:	**2025**
Scenario Assumptions	
Growth Assumptions	
Interest Rate	Base Case
Revenue	Moderate
Premium - GO Bond	11.00%
GO Bond Cap	
Fiscal Year Allocation	80%
Growth Type	Constant Value
Growth Amount	$110,000,000
Growth Rate	3.31%
Maximize Bond Cap?	**Maximize**
Save / Clear Scenario(s)	
Save Scenario	**Clear Scenario(s)**

Debt Affordability Modeling | Modeling Inputs Overview

To assess overall affordability, the DAC uses the model to project both outstanding direct debt and debt service payments under various modeling scenarios. Below is an overview of key model inputs the DAC considers.

	Model Input	Description	Significant Changes made via Model Update?
Held Constant Across Scenarios	**Debt Service on Existing Debt***	• Debt service schedules for existing debt (GO & Special Obligation (SO) debt)	
	Contract assistance payments*	• Projected payment schedules for existing contract assistance agreements	
	Issuance maturity terms for future debt	• Assumed bond maturity distribution across future issuances • Maturity Terms: 1 -10 yrs; 11 – 20 yrs; & 21 – 30yrs)	
	Other debt structuring assumptions for future debt	• Assumed interest only period for future debt • Debt service assumptions for future debt: level debt service vs. level principal	• New feature added to model
	Issuance timing	• Assumed bond issuance timing	• New feature added to model
Adjusted Across Scenarios	**Premium Assumptions**	• Assumed premium to be received	• New feature added to model
	Interest rates for new debt*	• Assumed interest rates for future debt issuances by maturity term	
	Revenue Growth*	• Assumed rate of growth for budgeted revenue	
	FY26 Projected Bond Cap (DAC Recommendation)	• Projected new direct debt issued in FY26	• Includes new “maximization” option
	Future Bond Cap Growth	• Assumed rate at which the bond cap will grow annually; based on DAC recommendation	• Includes option to grow by constant $ value or % rate

** While no changes to how the model incorporates these inputs was made, the functionality of new model results in significant improvement to the way input data is loaded and updated.*

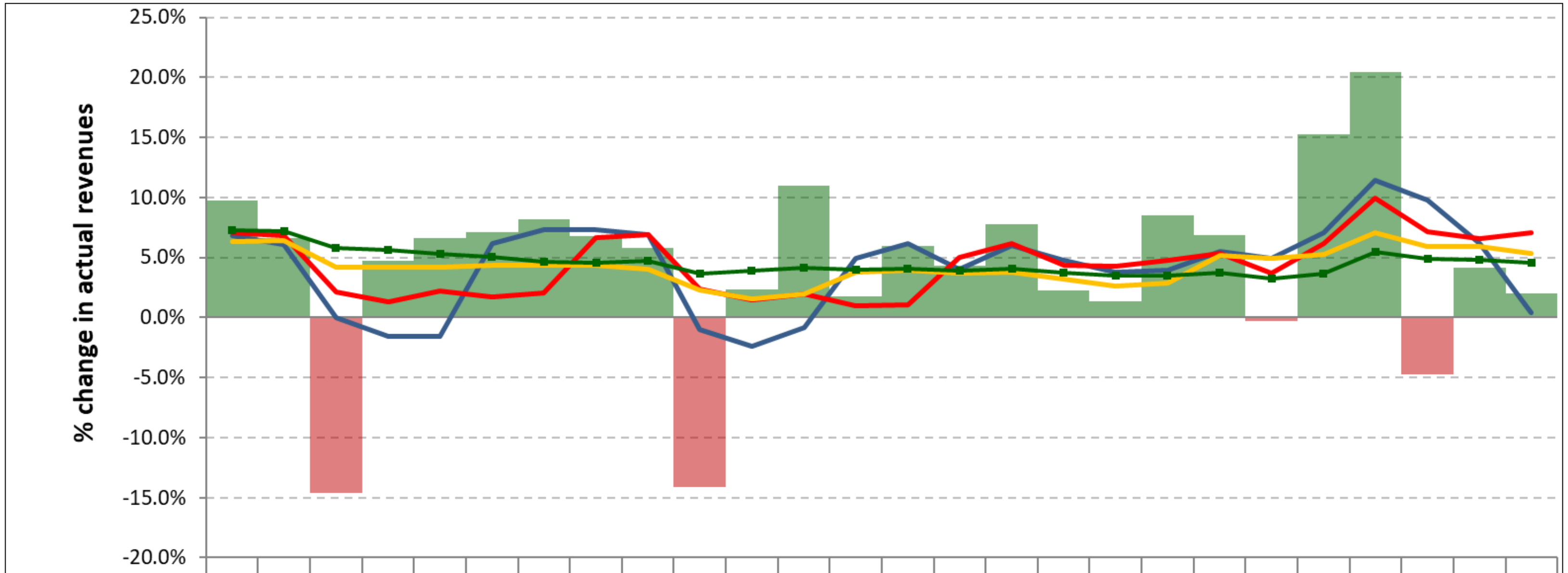
4. Revenue & Related Trends

Revenue Trends | Revenue Growth Assumptions for Modeling

Modeling Recommendation: *Maintain CAGR approach, exclude surtax revenues*

Revenue Year-Over-Year (YoY) Growth Rate Assumptions

- <u>Moderate</u>: **4.3%** avg annual YoY growth
- <u>Conservative</u>: **3.2%** annual growth rate (20yr CAGR low)
- <u>Stress Test</u>: **1.6%** annual growth rate (10yr CAGR low)



	FY00	FY01	FY02	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25 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%	15.2%	20.5%	-4.7%	4.2%	2.0%
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%	11.5%	9.8%	6.1%	0.4%
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%	9.9%	7.1%	6.6%	7.0%
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%	7.1%	5.9%	5.9%	5.3%
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%	5.4%	4.9%	4.8%	4.5%

Source: Massachusetts Department of Revenue (DOR), October 23, 2024

FY24 Tax Revenue Growth

- 1-yr change: 4.2%
- 3-yr: 6.1%
- 5-Yr: 6.6%
- 10-Yr: 5.9%
- 20-Yr: 4.8%

2001 – 2024 Lowest CAGR

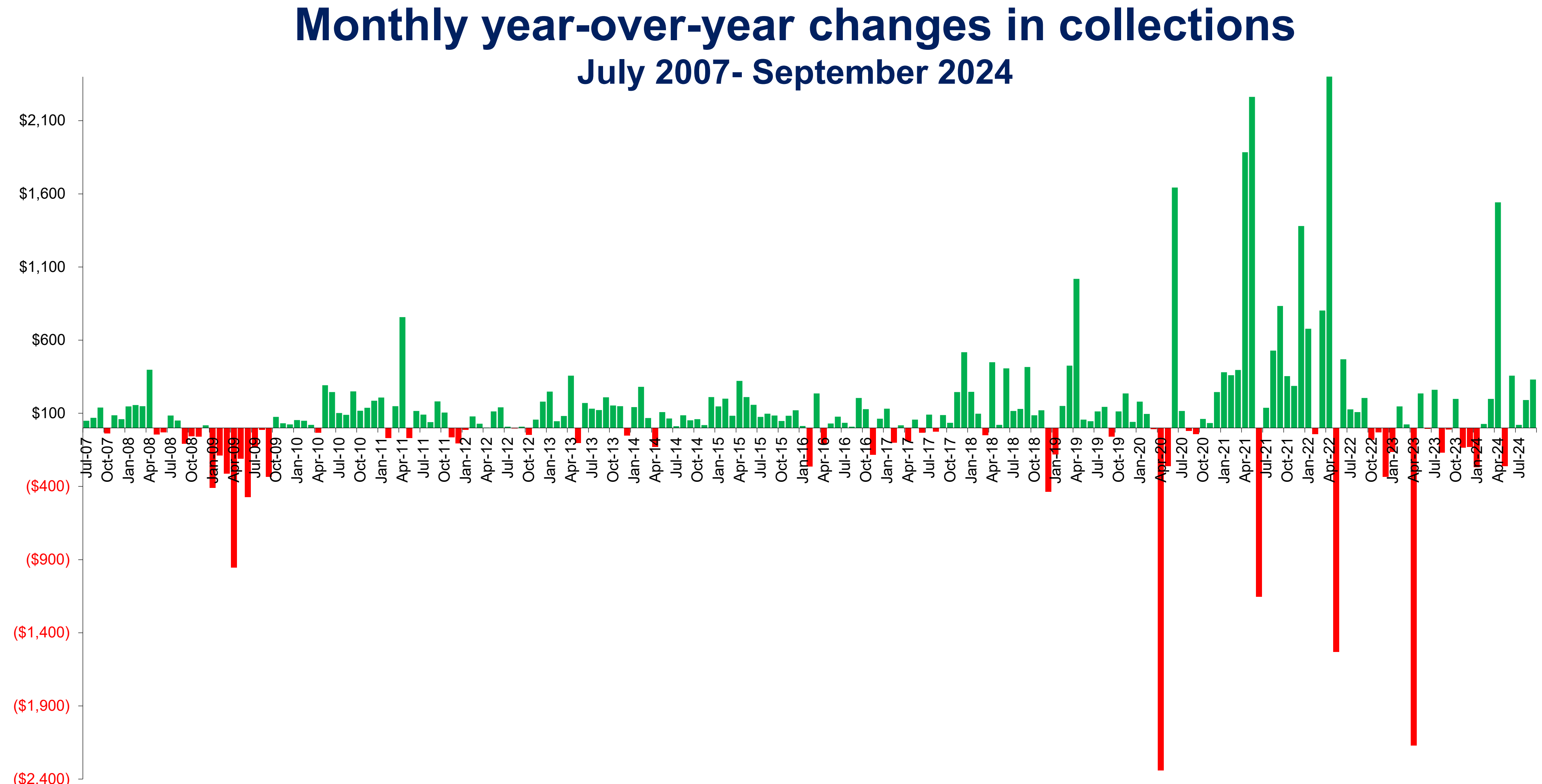
- **10-Year: 1.6% *(FY10)***
- **20-Year: 3.2% *(FY20)***

2001 – 2024 Averages

- **Annual YoY: 4.3%**
- 10-Year CAGR: 4.2%
- 20-Year CAGR: 4.5%

For modeling purposes DAC has typically taken a conservative approach and used the 10 & 20-yr CAGR lows for assumed future revenue growth.

Revenue Trends | Historical Revenue



Source: Massachusetts Department of Revenue (DOR), October 23, 2024

Recap of FY24 Revenue Performance

June 2024 and FY24 Tax Collections Summary (in $ millions)

Preliminary as of August 9, 2024

	June 2024					FY24				
	06/24 Actual Collections	06/24 vs 06/23 $ Fav/(Unfav)	06/24 vs 06/23 % Fav/(Unfav)	06/24 vs 06/24 Benchmark $ Fav/(Unfav)	06/24 vs 06/24 Benchmark % Fav/(Unfav)	**FY24 Actual Collections**	FY24 vs FY23 $ Fav/(Unfav)	FY24 vs FY23 % Fav/(Unfav)	FY24 vs FY24 Benchmark $ Fav/(Unfav)	FY24 vs FY24 Benchmark % Fav/(Unfav)
Income										
Income Withholding	1,613	243	+17.8%	175	+12.1%	17,967	1,320	+7.9%	390	+2.2%
Income Est. Payments	920	220	+31.5%	146	+18.9%	3,919	160	+4.3%	85	+2.2%
Income Returns/Bills	115	(1)	-1.2%	(13)	-10.4%	5,005	1,074	+27.3%	934	+22.9%
Income Refunds Net (outflow)	(84)	(8)	-9.9%	(4)	-5.1%	(2,775)	(218)	-8.5%	(277)	-11.1%
Subtotal Non-withheld Income	951	211	+28.6%	129	+15.6%	6,150	1,016	+19.8%	742	+13.7%
Subtotal Income	**2,564**	**455**	**+21.6%**	**303**	**+13.4%**	**24,117**	**2,336**	**+10.7%**	**1,133**	**+4.9%**
Sales & Use										
Sales - Regular	545	(40)	-6.9%	(31)	-5.4%	6,574	(128)	-1.9%	(65)	-1.0%
Sales - Meals	129	(10)	-7.2%	(5)	-3.7%	1,549	53	+3.5%	(17)	-1.1%
Sales - Motor Vehicles	112	(18)	-13.9%	(15)	-12.2%	1,199	1	+0.1%	(35)	-2.9%
Subtotal Sales & Use	**785**	**(68)**	**-8.0%**	**(52)**	**-6.2%**	**9,323**	**(73)**	**-0.8%**	**(118)**	**-1.2%**
Corporate & Business - Total	**878**	**(20)**	**-2.2%**	**(20)**	**-2.2%**	**4,833**	**(232)**	**-4.6%**	**(63)**	**-1.3%**
All Other	**267**	**(10)**	**-3.5%**	**36**	**+15.8%**	**2,528**	**(395)**	**-13.5%**	**15**	**+0.6%**
Total Tax Collections	**4,495**	**357**	**+8.6%**	**268**	**+6.3%**	**40,800**	**1,636**	**+4.2%**	**967**	**+2.4%**

Note: The figures above exclude Tax-Related Settlements & Judgments exceeding $10 million each. The total for these was $0.00 million in June 2024 and $15.61 million in FY24.

Source: Massachusetts Department of Revenue (DOR), October 23, 2024

Revenue Trends | FY24 Revenue Summary (cont.)

- Totaled $40.800 billion(*):
  - up $1.636 billion, or 4.2% over FY23
  - $967 million, or 2.4% above benchmark

  We had
  - a decrease in capital gains tax collections relative to FY23 collections,
  - increases in withholding and non-withheld income tax,

    (partially offset by) decreases in
  - sales and use tax, corporate & business tax, and “all other” tax
- Major tax categories:
  - non-withheld income tax, $742M above benchmark
  - withholding, $390M above benchmark
  - corporate tax, $63M below benchmark
  - sales tax, $118M below benchmark
  - all other, $15M above benchmark
- Capital gains:
  - totaled $2.07B(**), $591M above the FY24 threshold of $1.479B
    - Excess amount was transferred to Commonwealth Stabilization Fund, State Retiree Benefits trust Fund, and Commonwealth Pension Liability Fund

(*) Excluding “tax-related” settlements of $15.61 million
(**) This total does not include an estimated $924 million in capital gains tax revenue collected from the 4% income surtax.

Source: Massachusetts Department of Revenue (DOR), October 23, 2024

FY25 Year-to-Date Tax Collections

September 2024 Tax Collections Summary (in $ millions)

Preliminary as of October 3, 2024

	Month of September					FY25 YTD as of September				
	09/24 Actual Collections	09/24 v. 09/23 $ Fav/(Unfav)	09/24 v. 09/23 % Fav/(Unfav)	09/24 Actual v. Benchmark $ Fav/(Unfav)	09/24 Actual v. Benchmark % Fav/(Unfav)	**09/24 YTD Actual Collections**	09/24 YTD v. 09/23 YTD $ Fav/(Unfav)	09/24 YTD v. 09/23 YTD % Fav/(Unfav)	09/24 YTD Actual v. Benchmark $ Fav/(Unfav)	09/24 YTD Actual v. Benchmark % Fav/(Unfav)
Income										
Income Withholding	1,494	80	+5.6%	(78)	-4.9%	4,333	260	+6.4%	(84)	-1.9%
Income Est. Payments	1,066	200	+23.0%	176	+19.7%	1,162	208	+21.8%	172	+17.4%
Income Returns/Bills	142	(5)	-3.7%	(44)	-23.7%	281	(16)	-5.4%	(42)	-12.9%
Income Refunds Net (outflow)	(98)	(5)	-5.2%	0	+0.2%	(181)	(6)	-3.3%	(1)	-0.7%
Subtotal Non-withheld Income	1,109	189	+20.6%	132	+13.5%	1,263	186	+17.3%	129	+11.4%
Subtotal Income	**2,603**	**269**	**+11.5%**	**54**	**+2.1%**	**5,596**	**446**	**+8.7%**	**45**	**+0.8%**
Sales & Use										
Sales - Regular	575	99	+20.7%	9	+1.6%	1,725	127	+7.9%	6	+0.4%
Sales - Meals	144	18	+14.1%	(18)	-10.8%	439	31	+7.6%	(18)	-3.9%
Sales - Motor Vehicles	97	(6)	-5.6%	(19)	-16.4%	293	(3)	-1.1%	(19)	-6.0%
Subtotal Sales & Use	**816**	**111**	**+15.7%**	**(28)**	**-3.3%**	**2,456**	**155**	**+6.7%**	**(30)**	**-1.2%**
Corporate & Business - Total	**888**	**(22)**	**-2.4%**	**(47)**	**-5.0%**	**1,113**	**4**	**+0.3%**	**(47)**	**-4.0%**
All Other	**211**	**(28)**	**-11.6%**	**(8)**	**-3.6%**	**661**	**(63)**	**-8.8%**	**(12)**	**-1.8%**
Total Tax Collections	**4,518**	**331**	**+7.9%**	**(29)**	**-0.6%**	**9,826**	**541**	**+5.8%**	**(44)**	**-0.4%**

Note: The figures above exclude Tax-Related Settlements & Judgments exceeding $10 million each. The total for these was $0.00 million in September 2024 and $0.00 million in FY25 year-to-date.

Source: Massachusetts Department of Revenue (DOR), October 23, 2024

FY25 Year-to-Date Tax Collections

- **Negative** performances versus benchmark in:
  - withholding tax
  - sales tax, corporate & business tax, and
  - "all other" taxes,

  partially offset by a **positive** performance versus benchmark in
  - non-withholding income tax

- Year-to-date total $9.826 billion:
  - $541 million, or 5.8% more than the same period in fiscal 2024
  - $44 million, or 0.4% below year-to date benchmark

Source: Massachusetts Department of Revenue (DOR), October 23, 2024

FY25 Year-to-Date Tax Collections

More specifically:

- Withholding: $4.333B, +$260M, +6.4% actual, but $84M or 1.9% below benchmark
- Non-withholding: $1.263B,+$186M or +17.3% actual, and $129M or 11.4% above benchmark
- Sales & use tax collections: $2.456B, +$155M or +6.7% actual, but $30M or 1.2% below benchmark
- Corporate and business tax collections: $1.113B, +$4M or +0.3% actual, but $47M or 4.0% below benchmark
- All Other taxes: $661M, -$63M or -8.8% actual, and $12M or 1.8% below benchmark.

Source: Massachusetts Department of Revenue (DOR), October 23, 2024

Revenue Trends | Economic Outlook

Vendor economic projections* – FY25 and FY26

	Optimistic				Baseline				Pessimistic (Moody's Sc #3)			
	Moody's		IHS		Moody's		IHS		Moody's		IHS	
	FY25	FY26	FY25	FY26	FY25	FY26	FY25	FY26	FY25	FY26	FY25	FY26
S&P 500	26.0%	9.9%	24.7%	5.7%	24.5%	4.0%	24.3%	2.7%	21.1%	-27.5%	23.6%	-1.8%
Real Gross State Product	2.9%	3.1%	2.3%	2.4%	2.3%	2.2%	1.8%	1.7%	0.6%	0.0%	0.8%	0.6%
Wages & Salaries	4.8%	5.1%	5.0%	5.8%	4.5%	4.4%	4.3%	5.0%	2.8%	1.7%	2.9%	2.7%
Personal Income	4.6%	5.1%	5.1%	6.5%	4.4%	4.6%	4.5%	5.6%	2.8%	1.3%	3.8%	4.0%
Disposable Personal Income	3.9%	4.7%	4.4%	6.4%	3.8%	4.3%	3.9%	5.7%	2.5%	1.7%	3.3%	4.5%
Employment	1.4%	1.2%	1.2%	0.5%	1.2%	0.7%	0.9%	0.5%	-1.3%	-1.5%	0.0%	-1.1%
Retail Sales	4.8%	5.1%	2.0%	3.6%	3.1%	3.8%	1.5%	2.5%	-2.4%	-1.7%	0.5%	1.3%
Unemployment Rate	3.1%	2.9%	3.5%	3.6%	3.5%	3.5%	3.7%	3.9%	5.0%	6.3%	4.5%	5.6%
New Vehicle Registration	4.8%	11.4%	1.5%	6.0%	1.6%	10.6%	1.4%	2.0%	-10.6%	-3.8%	-2.4%	-1.7%

* Note: Projections are from October 2023 and have not been updated since the Presidential election. Updated projections were not available at the time of this report.

Sources: Massachusetts Department of Revenue (DOR), Moody's Analytics, IHS Markit, October 23, 2024

Revenue Trends | Economic Outlook

Near-term economic outlook*

Key Assumptions	Moody's baseline	S&P baseline
US Economic Outlook	• Real GDP is projected to rise 2.6% in '24, 2.1% in 2025, and 2.0% in 2026. • The 10-year Treasury yield will average 4% in the Q3 '24. The rate will rebound to its equilibrium level of 4.1% by 2025 and remain near this level until the end of the decade.	• Real GDP is projected to rise to 1.8% in the second half of 2024 and all of 2025. • Improved financial conditions: Treasury and private yields are declining; equity values are increasing; and the US dollar has weakened in recent weeks.
Monetary Policy:	• Expects the Federal Reserve will cut the policy rate by 25 basis points in September and December, followed by gradual reductions to 3% by 2027 and 2.5% by 2030.	• Assumes the Fed's first rate cut is in September followed by a second rate cut in December. The Fed then cuts its policy rate seven times over 2025, and eventually to 2.50% to 2.75% by early 2026, while shrinking its balance sheet by about one third.
Employment	• Employment growth will moderate throughout the remainder of 2024 and will average less than 1% growth in 2025. Some of the growth will come from the ongoing immigration. • The jobless rate is expected to average 4.3% in the third quarter before finishing the year at 4.2% and easing to 4.1% by the end of 2025	• Forecasts the U.S. will add 130k jobs per month in Q4 '24, 56k in Q1 '25, and 42k per month in Q2 '25.
Inflation	• Projecting inflation of 2.6% in the third quarter of 2024. Inflation will return to target by early 2025.	• Expects core PCE inflation of 2.0% on a sustained basis by late 2026.
Fiscal Policy:	• Assumes the $10K Federal cap on SALT deductions is extended beyond the scheduled expiration data on 12/31/2025.	• Assumes the personal income tax provisions included in the TCJA are extended beyond the scheduled expiration on 12/31/2025. • Corporate taxes: the Inflation Reduction Act remains intact as does scheduled phase outs of corporate provisions in the TCJA.
Potential risk	• The Fed could ease too slowly, causing the economy to weaken more than expected. • Political gridlock or dysfunction could result in government inaction and undermine confidence or result in a debt limit breach in early 2025, pushing the economy into recession. • With hiring now weakening, a return to pre-pandemic levels of layoffs would likely result in job losses, undermining consumer spending and growth. • The war in the Middle East, an expansion of Russia's invasion of Ukraine and resulting sanctions.	• Balance sheet strains in the banking sector result in financial institutions severely tightening lending standards and curtailing credit expansion. As a result, credit-dependent consumer spending and small business activity suffer. • Higher energy prices due to a worsening in the conflicts in the Ukraine and in the Middle East.

* Note: Outlooks are from October 2023 and have not been updated since the Presidential election. Updated forecasts were not available at the time of this report.

Sources: Massachusetts Department of Revenue (DOR), Moody's Analytics, IHS Markit, October 23, 2024

5. Interest Rate & Bond Premium Trends

Interest Rate & Premium Trends | Interest Rate Assumptions

Recommendation: *Maintain last year's general approach; use Moody's projections as a baseline. Escalate rates by 50 bps for the conservative scenario. Note, when including premium into the model, interest rates are based on assumed bond coupon.*

Interest Rate Assumptions (without premium)

- Base Case: **3.7 – 4.7%**
- Conservative: **4.2% - 5.2%**

Interest Rate Assumptions (with premium): 5%

- Based on bond coupon typically used by the Commonwealth

Baseline Scenario - moderate scenario based on Moody's Current Projections, which holds rates relatively flat

	2025	2026	2027	2028	2029	2030
10 yr baseline *(Moody's 20yr Aa – 70bps)*	3.71	3.69	3.68	3.67	3.66	3.65
20 yr baseline *(Moody's Aa)*	4.41	4.39	4.38	4.37	4.36	4.35
30 yr baseline (*Moody's 20yr Aa – 70bps)*	4.71	4.69	4.68	4.67	4.66	4.65

NOTE: *Moody's has not updated its forecasts since the election, DOR estimates that new projections will not come out until December.*

More Conservative Scenario - baseline escalated by some escalation factor (here we are using 50 bps)

	2025	2026	2027	2028	2029	2030
10 yr conservative *(10 yr baseline + 40 bps)*	4.21	4.19	4.18	4.17	4.16	4.15
20 yr conservative *(20 yr baseline + 40 bps)*	4.91	4.89	4.88	4.87	4.86	4.85
30 yr conservative *(30 yr baseline + 40 bps)*	5.21	5.19	5.18	5.17	5.16	5.15

Sources: Massachusetts Department of Revenue (DOR), Moody's Analytics, October 23, 2024

Interest Rate & Premium Trends | Developing Interest Rate Assumptions

AAA Rated Muni Bonds

Issue	Maturity	2022	2023	Today	*Last Week*
National	10 Year	3.35	3.35	2.95	*2.85*
National	20 Year	3.80	4.10	3.66	*3.45*
National	30 Year	4.00	4.30	3.85	*3.75*

AA Rated Muni Bonds

Issue	Maturity	2022	2023	Today	*Last Week*
National	10 Year	3.60	3.45	3.05	*2.95*
National	20 Year	4.20	4.40	3.75	*3.65*
National	30 Year	4.40	4.60	4.05	*3.95*

A Rated Muni Bonds

Issue	Maturity	2022	2023	Today	*Last Week*
National	10 Year	3.75	3.65	3.30	*3.20*
National	20 Year	4.40	4.65	3.95	*3.85*
National	30 Year	4.60	4.85	4.30	*4.20*

Source: FMS Bonds Inc.

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+

Key "Snapshot" Observations

- Yields have been trending down; current yields are below 2022 levels.
- AAA vs AA yields: 10 bps – 20 bps differential

Modeling Rate Methodology - *applied current AA spreads to Moody's- Aa 20-yr projections*

Baseline Scenario - moderate scenario based on Moody's Current Projections, which holds rates relatively flat

	2025	2026	2027	2028	2029	2030
10 yr baseline *(Moody's 20yr Aa – 70bps)*	3.71	3.69	3.68	3.67	3.66	3.65
20 yr baseline (Moody's Aa)	4.41	4.39	4.38	4.37	4.36	4.35
30 yr baseline *Moody's 20yr Aa – 70bps)*	4.71	4.69	4.68	4.67	4.66	4.65

More Conservative Scenario - baseline escalated by some escalation factor (here we are using 50 bps)

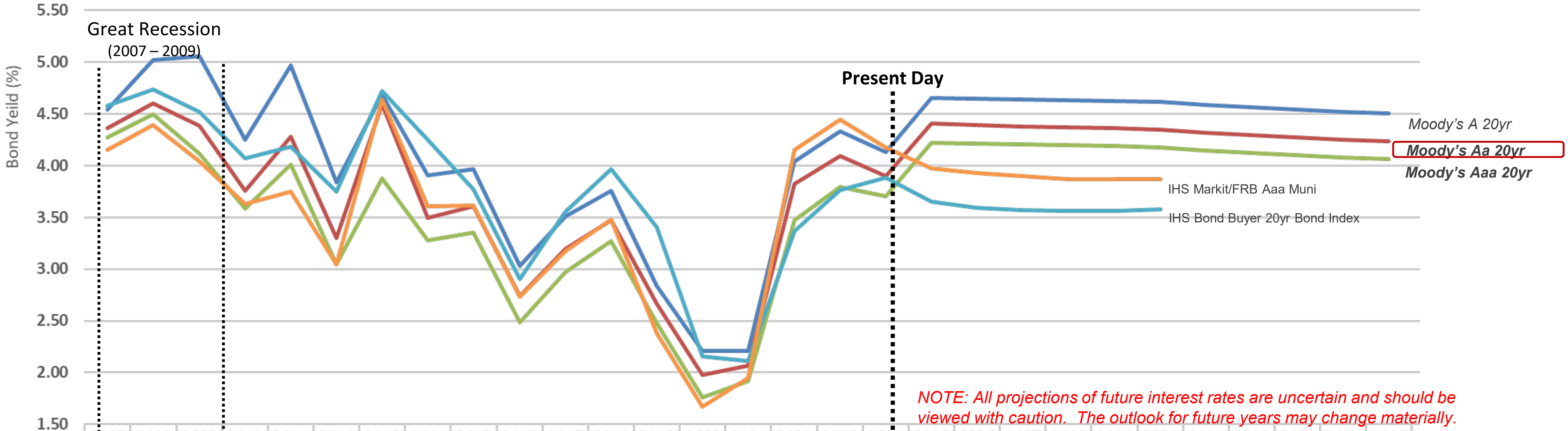
	2025	2026	2027	2028	2029	2030
10 yr conservative *(10 yr baseline + 40 bps)*	4.21	4.19	4.18	4.17	4.16	4.15
20 yr baseline *(20 yr baseline + 40 bps)*	4.91	4.89	4.88	4.87	4.86	4.85
30 yr baseline *(30 yr baseline + 40 bps)*	5.21	5.19	5.18	5.17	5.16	5.15

Sources: Massachusetts Department of Revenue (DOR), Moody's Analytics, October 23, 2024

Interest Rate & Premium Trends | Interest Rate Baseline Assumptions

For modeling future debt issuances, recommend continuing to use Moody's projections for 20yr Aa muni as baseline. Represents conservative approach given MA actuals typically fall between Aaa and Aa.

- Rates are projected to increase slightly in 2025 and hold steady over the next 10 years
- Moody's 2023 projections for 2024 were ~68 bps higher than 2024 actuals.*(e.g. for Aa: 4.58 projection vs. 3.90) actual)*
- Moody's Aa 20 yr rates 2007 – 2024: Average: **3.57%**, High **4.6%** (*2008, 2013*), Low **1.97%** (*2020*)

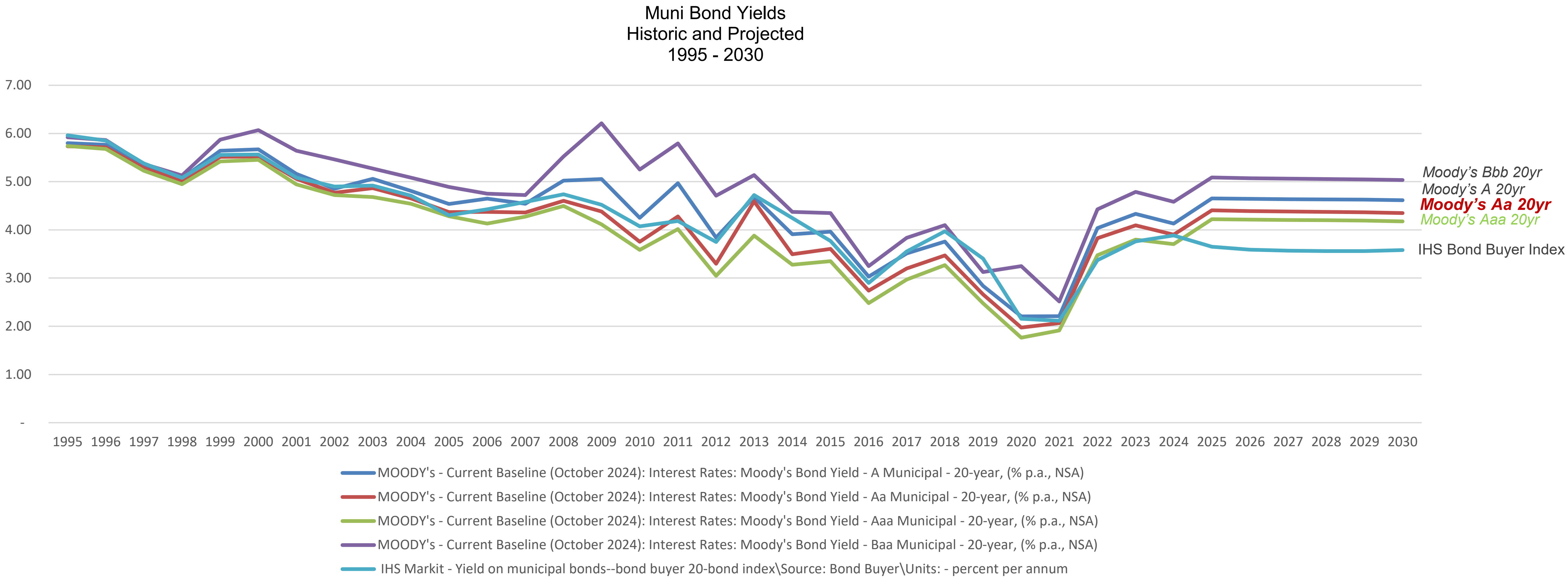


	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Moody's A 20yr Muni	4.54	5.02	5.05	4.25	4.97	3.84	4.68	3.91	3.96	3.03	3.51	3.76	2.84	2.21	2.21	4.04	4.33	4.13	4.65	4.64	4.64	4.63	4.63	4.61	4.59	4.56	4.54	4.52	4.51
Moody's Aa 20yr Muni	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	3.83	4.10	3.90	4.41	4.39	4.38	4.37	4.36	4.35	4.32	4.30	4.27	4.25	4.24
Moody's Aaa 20yr Muni	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	3.48	3.80	3.70	4.22	4.21	4.21	4.20	4.19	4.18	4.14	4.12	4.10	4.08	4.06
IHS Markit/Bond Buyer 20yr Index	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	2.11	3.37	3.76	3.88	3.65	3.59	3.57	3.56	3.56	3.58					
IHS Aaa Muni Index	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	1.95	4.15	4.45	4.17	3.97	3.93	3.90	3.87	3.87	3.87					

Sources: Massachusetts Department of Revenue (DOR), Moody's Analytics, October 23, 2024

Interest Rate & Premium Trends | Historic Yield Curve (Baa – Aaa)

Since 1995 (~ 3 business cycles) Moody's Aa 20 yr muni has averaged 4.17%, with a high of 5.7% (1995), and low of low 1.97% (2020). Going forward Moody's is currently forecasting rates will land slightly above average.



Sources: Massachusetts Department of Revenue (DOR), Moody's Analytics, October 23, 2024

Interest Rate & Premium Trends | Bond Premium Assumptions

Bond premium refers to the excess price paid for a bond over and above its face value. Commonwealth tax-exempt bond transactions typically include a premium which result in actual bond proceeds that exceed the par issuance amount.

Incorporating premium into the model

- The updated model includes a premium function that enables the end-user to incorporate a premium assumption into projected future debt issuances.
- Why it matters: Premium results in reduced debt service costs and a lower par issuance amount which can impact modeling results with respect to debt limits and policies.
- Actual premium is based on market conditions at bond pricing, and therefore can vary.
- Illustrative Premium Scenarios based on actual results:
  - Premium High: 13.3% - *recent high*
  - Optimistic: 11.0% - *average premium excluding high and low*
  - Moderate: 10.4% - *average premium*
  - Conservative: 7.8% - *2023 average (year of lowest premium)*
  - Premium Low: *3.1%* - *recent low*

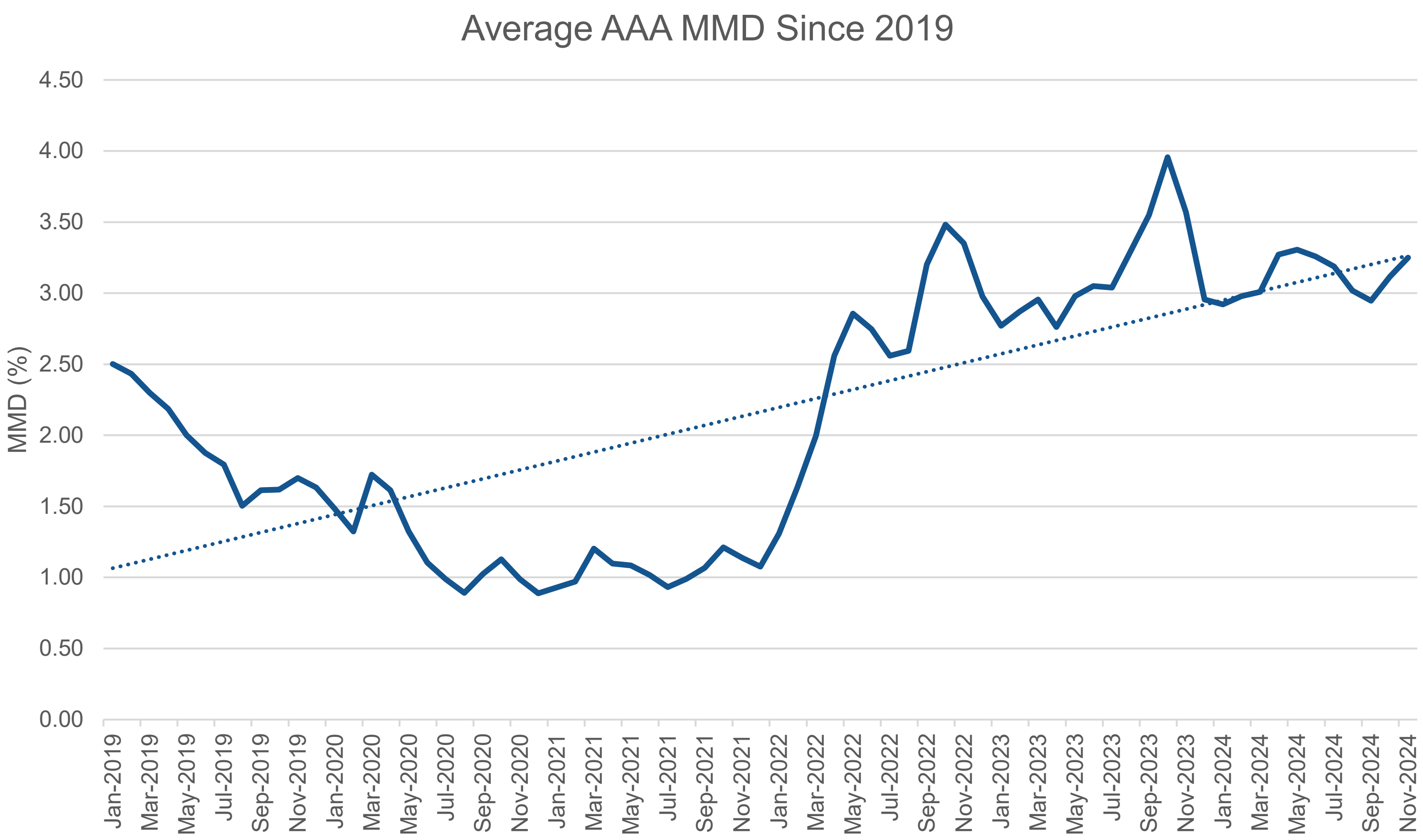
SOURCE: Office of the Treasurer & Receiver

Recent GO Bond Transaction Premiums

Date	Series	Par	Premium	% Prem
22-Feb	2022 A&B	650,000	86,355	13.30%
22-Oct	2022 C	902,480	88,790	9.80%
22-Dec	2022 D&E	700,000	82,263	11.80%
23-Jul	2023 A	970,000	110,080	11.30%
23-Oct	2023 B, C, D, & E	1,285,000	39,248	3.10%
24-Jan	2024 A	1,045,000	130,259	12.50%
24-Jun	2024 B	750,000	75,479	10.10%
24-Sep	2024 C, D, E, F	850,000	91,141	10.70%

Interest Rate & Premium Trends | Bond Premiums & MMD

MMD (Municipal Market Data) is a proprietary yield curve that serves as a key reference in the muni bond market. The MMD curve is based on muni AAA valuations and market activity and is used as a benchmark for pricing and evaluating newly issued muni bonds.



Key Takeaways

- The amount of bond premium received is determined by the difference between the coupon rate on the bonds offered (we assume 5%) and the AAA MMD
- As AAA MMD rises and bond premium will be reduced
- Previous slide show low point of premium in October 2023 when you can see the spike in AAA MMD

Discussion Point: What premium assumptions is the Committee comfortable using for modeling purposes?

- Illustrative Premium Scenarios based on actual results (from prior slide)
  - Premium High: 13.3% - *recent high*
  - Optimistic: 11.0% - *average premium excluding high and low*
  - Moderate: 10.4% - *average premium*
  - Conservative: 7.2% - *2023 average (year of lowest premium)*
  - Premium Low: *3.1% - recent low*

6. Commonwealth Debt Portfolio

Debt Affordability Committee | Current Outstanding Debt

DAC considers all outstanding debt & contingent liabilities in its affordability analysis.

Commonwealth Debt	FY25 Outstanding Debt ($ in millions)
General Obligation (GO)	$28,128.2
Special Obligation (SO)	6,033.2
Federal Grant Anticipation Notes (GANS)	255.8
Total	**$34,417.2**

Unaudited, subject to change
Source: Office of the State Treasurer and Receiver General

Outstanding GO Debt

- Fixed Rate Debt: $27,860.3M (99%)
- Variable Rate Debt: $267.9M (1%)

Commonwealth Contract Assistance	Contract Assistance End Date	FY25 Payment ($ in millions)
MassDOT (1)	2050	$125.0
MA Clean Water Trust	2051	63.4
MassDevelopment	2050	10.6
Total		**$199.0**

SOURCE: Office of Comptroller

Commonwealth Contingent Liabilities	Outstanding Debt* ($ in millions)
Mass. Bay Transportation Authority (MBTA)	$88.0
UMass Building Authority (UMBA)	-
Regional Transit Authorities (RTAs)	n/a
Steamship Authority	82.9
MassDevelopment	-

**As of March 31, 2024*

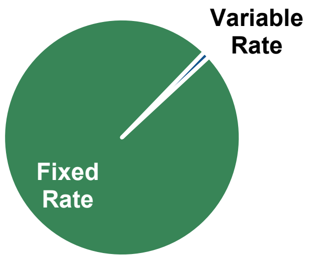
Debt Affordability Committee | Conservatively Managed Debt Portfolio

Key Takeaways

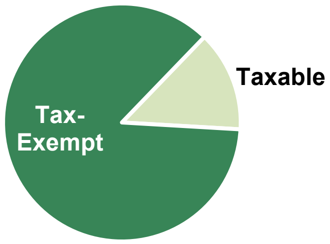
- As of September 30, 2024, total GO debt outstanding was $28.1 billion:
  - $27.8 billion or 99% was fixed rate
  - $267.9 million or 1% was variable rate
  - $24.3 billion or 86% was tax-exempt
- The Commonwealth has actively managed its debt profile by increasing the ratio of fixed rate debt as interest rates have decreased and utilizing refundings to manage debt service
- There are no interest rate swaps outstanding as of September 30, 2024

GO Debt Composition

99% of Debt in Fixed Rate Mode

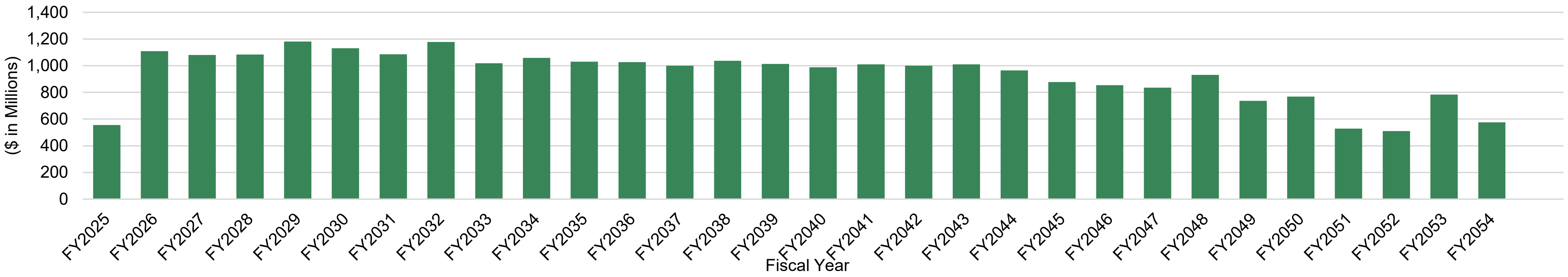


86% of Debt are Tax-exempt



GO Principal Amortization

41% of Outstanding Principal Amortizes Through FY 2035



Source: Commonwealth of Massachusetts State Treasurer and Receiver General

7. Credit Factors

Credit Factors | Rating Agency Scale Overview

All three credit rating agencies long-term ratings for the Commonwealth are aligned at high investment grade.

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-

Credit Factors | Commonwealth Credit Profile Overview

Rating agencies have consistently given Commonwealth high marks across all credit factors, except existing long-term liabilities (debt & pension/OPEB).

Key Takeaways

- While the 3 agencies take nuanced approaches to assigning ratings, all methodologies align around 5 key credit factors
  - Governance
  - Economy
  - Financial position
  - Budgetary performance
  - Long term liabilities
- The Commonwealth scores high in all areas, except long term liabilities.
  - MA's investment in local entities – typically funded at the local level in other states – is a driver of relatively elevated debt levels.

Agency	Rating Factors Framework	Commonwealth Scoring
S&P Scoring 1 = strongest 4 =weakest	Government Framework	Score: **1.5** *(indicative of AAA)*
	Financial Management	Score: **1.0** *(indicative of AAA)*
	Economy	Score: **1.4** *(indicative of AAA)*
	Budget Performance	Score: **1.7** *(indicative of AA+)*
	Debt & Liability Profile	Score: **3.5** *(indicative of BBB)*
Moody's	Economy (30%)	Score: **Aaa**
	Financial Performance (20%)	Scores: **Aaa**
	Governance (20%)	Score: **Aaa**
	Leverage (30%)	Score: **A**
	ESG Consideration	Score: **CIS-2 Neutral to low**
Fitch	Economic Base	Score: **Strong**
	Revenue Framework	Score: **aaa**
	Expenditure Framework	Score: **aaa**
	Long Term Liability Burden	Score: **aa**
	Operating Performance	Score: **aaa**

Credit Factors | Massachusetts Credit Summary

Economy	• Broad and diverse economy including significant strength in healthcare, technology and education sectors • Well-trained labor pool experiencing strong wage growth over the last 10 years • Statewide per capita income of $84,945 was the second highest among all states and was 130% of the national per capita income in 2022
Finances & Liquidity	• Massachusetts' individual income taxes and sales taxes accounted for approximately 80% of total tax revenue in FY 2024 • From $2.0 billion in FY 2018, the Stabilization Fund balance has increased by roughly 341% to a preliminary $8.8 billion for FY2024. • The Commonwealth has access to a $500 million line of credit through May 2026
Budget and Financial Management Controls	• Strong financial, debt and budget management policies include: (i) estimating consensus revenue; (ii) forecasting multi-year financial plans; (iii) issuing annualized formal debt affordability statements and (iv) planning multi-year capital investments • Strong budget gap closing capacity – if there is a revenue shortfall, the Governor has the authority to cut expenses for executive agencies without legislative approval • Ongoing economic and revenue monitoring throughout the Commonwealth
Long-term Liabilities	• There is an annual administrative limit on the amount of bond-funded capital expenditures, or "bond cap", to keep the Commonwealth's debt within affordable levels (FY 2025 bond cap is $3.117 billion) • Debt is elevated compared to other states in part because of the Commonwealth's practice of financing projects for highly-rated local governments • As of January 1, 2023, the funded ratio of the pension system based on the actuarial value was 63.5% • Under current law, the unfunded pension liability must be fully amortized by June 30, 2040. The current funding schedule fully amortizes the liability by June 30, 2037

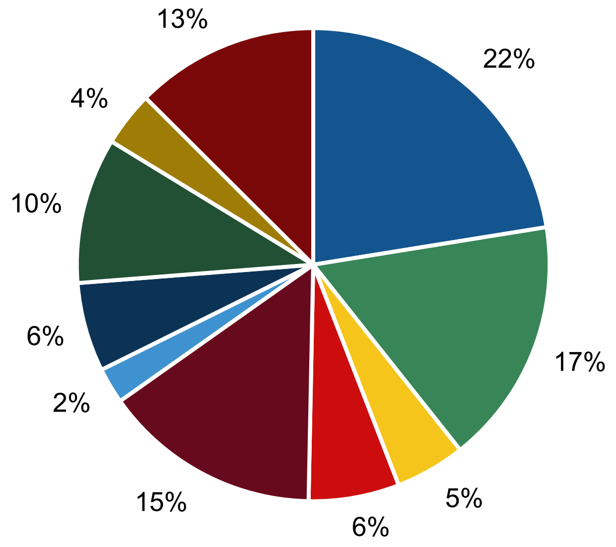
Credit Factors | Massachusetts Industry Mix

Key Takeaways

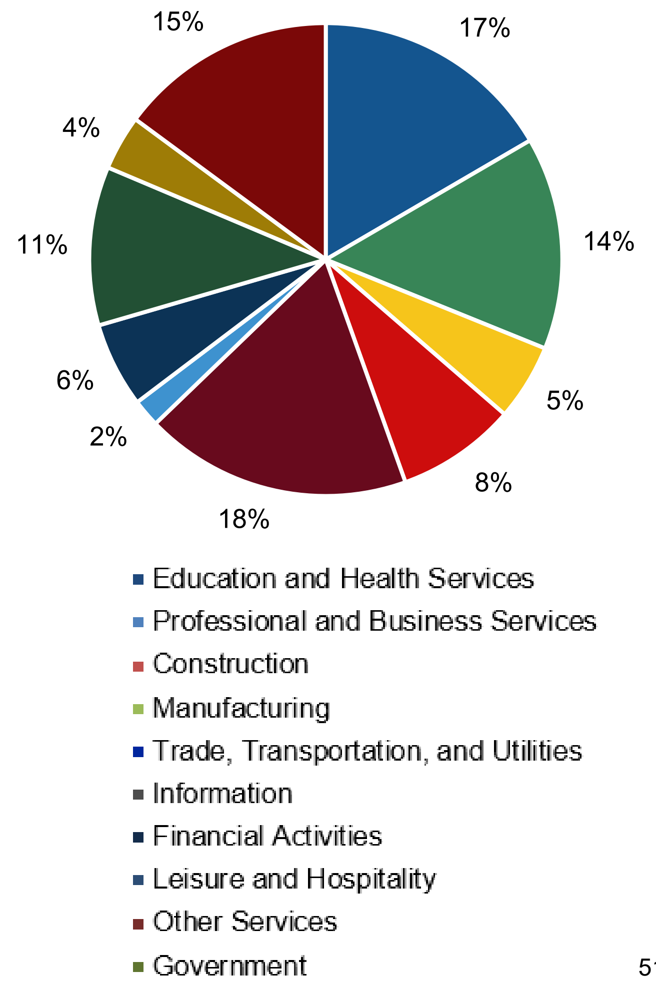
- Massachusetts' industry sector diversification is similar to that of the US with the top 5 sectors comprising approximately 77% of employment
- Education and Health Services sector has consistently been the top sector in the Commonwealth. The clusters of colleges, universities, and teaching hospitals contribute to Massachusetts being a hub for technology and research
- Professional & Business Services sector has been increasingly important in the Commonwealth, both as a share of employment and in terms of its contribution to state gross domestic product ("GDP")

Employment Composition of Massachusetts and the United States as of May 2024

Massachusetts



United States



Industry Sector	MA	US
Educ. & Health Services	22%	17%
Prof & Business Services	17%	14%
Trade, Transp., Utilities	15%	18%
Government	13%	15%
Leisure & Hospitality	10%	11%
Top 5 Total	**77%**	**76%**

(1) North American Industry Classification System
Source: U.S. Bureau of Labor Statistics, as of May 2024 (*https://www.bls.gov/sae/data/*)
Source: U.S. Bureau of Labor Statistics, as of May 2024 (*https://www.bls.gov/web/empsit/ceseeb1b.htm*)
Notes: Not seasonally adjusted

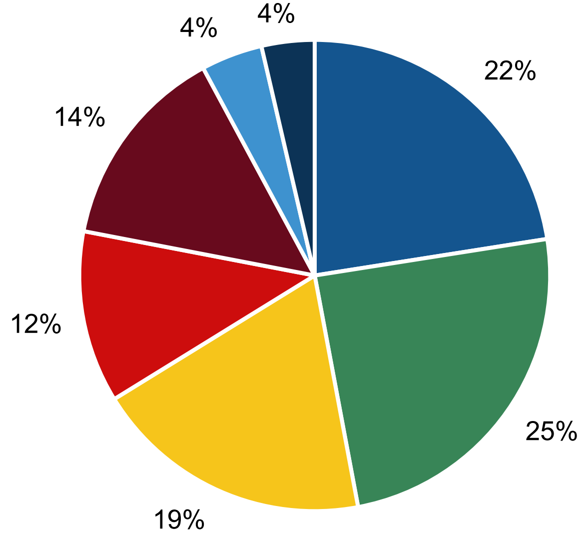
Credit Factors | Massachusetts Industry Mix (cont.)

Key Takeaways

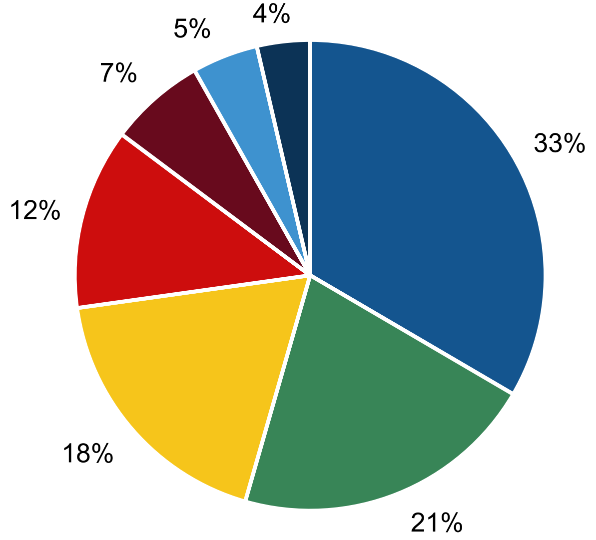
- As noted on the prior slide, the Education and Health Services sector comprises 22% of the Commonwealth's industry mix, which is a higher percentage than that of the US (17%), which provides a number of credit positives for the Commonwealth
  - Massachusetts is home to several of the top teaching hospitals in the world
  - Massachusetts surpasses the rest of the country in Private Colleges, Universities, and Professional Schools at 14%, compared to 7% in the US
  - Strong educational presence creates foundation for future economic growth

Breakdown of Education and Health Services Sector by Industry as of May 2024

Massachusetts



United States



Education & Health Services	MA	US
Hospitals	25%	21%
Ambulatory Health Care Services	22%	33%
Social Assistance	19%	18%
Priv. Colleges, Universities, Prof. Schools	14%	7%
Nursing & Residential Care Facilities	12%	12%
Top 5 Total	**92%**	**91%**

- Ambulatory Health Care Services
- Hospitals
- Social Assistance
- Nursing and Residential Care Facilities
- Private Colleges, Universities, and Professional Schools
- Private Elementary and Secondary Schools
- Other Private Educational Services

Source: U.S. Bureau of Labor Statistics, as of May 2024 (*https://www.bls.gov/sae/data/*)
Source: U.S. Bureau of Labor Statistics, as of May 2024 (*https://www.bls.gov/web/empsit/ceseeb1b.htm*)
Notes: Not seasonally adjusted

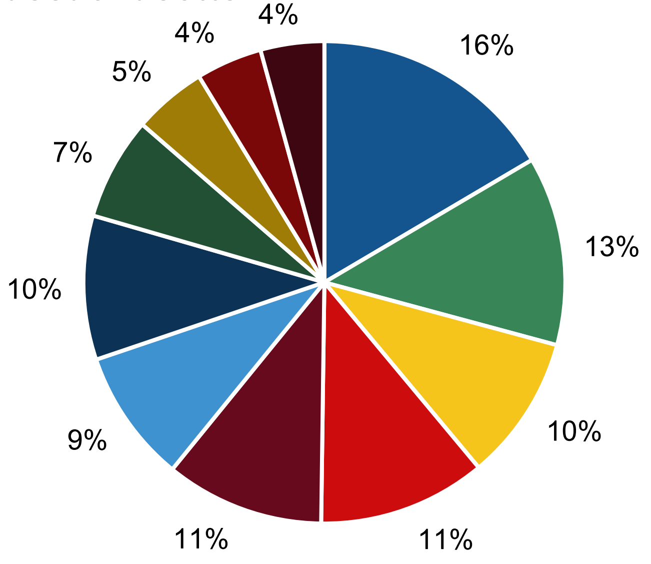
Credit Factors | Massachusetts Industry Mix (cont.)

Key Takeaways

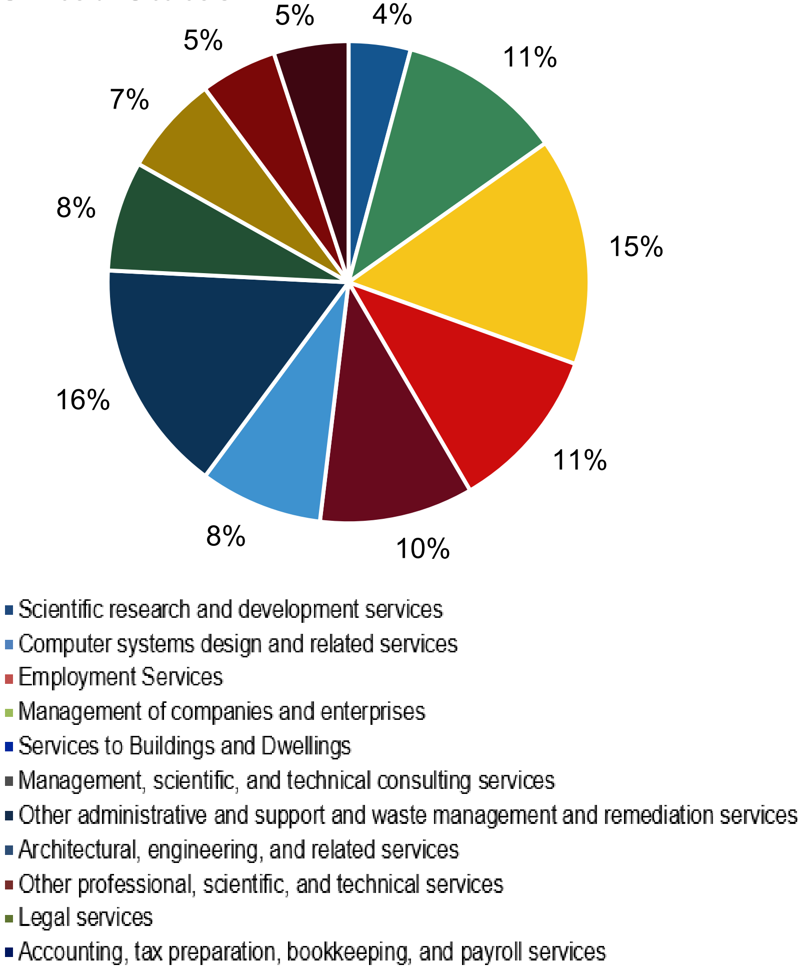
- Professional and Business Services sector has been increasingly important in the Commonwealth, both as a share of employment and in terms of its contribution to Commonwealth GDP
- In Massachusetts, the leading subsectors in terms of employees are Scientific Research & Development Services and Computer Systems Design
- During the pandemic, Professional & Business Services sector increased its prominence in the Commonwealth in terms of employment
- These subsectors benefit from the Commonwealth's well-established Higher Education and Health Services sector

Breakdown of Professional and Business Services Sector by Industry as of May 2024

Massachusetts



United States



Professional & Business Services	MA	US
Scientific R&D Services	16%	4%
Computer Systems Design	13%	11%
Mgmnt of Companies & Enterprises	11%	11%
Services to Buildings & Dwellings	11%	10%
Employment Services	10%	15%
Top 5 Total	**61%**	**51%**

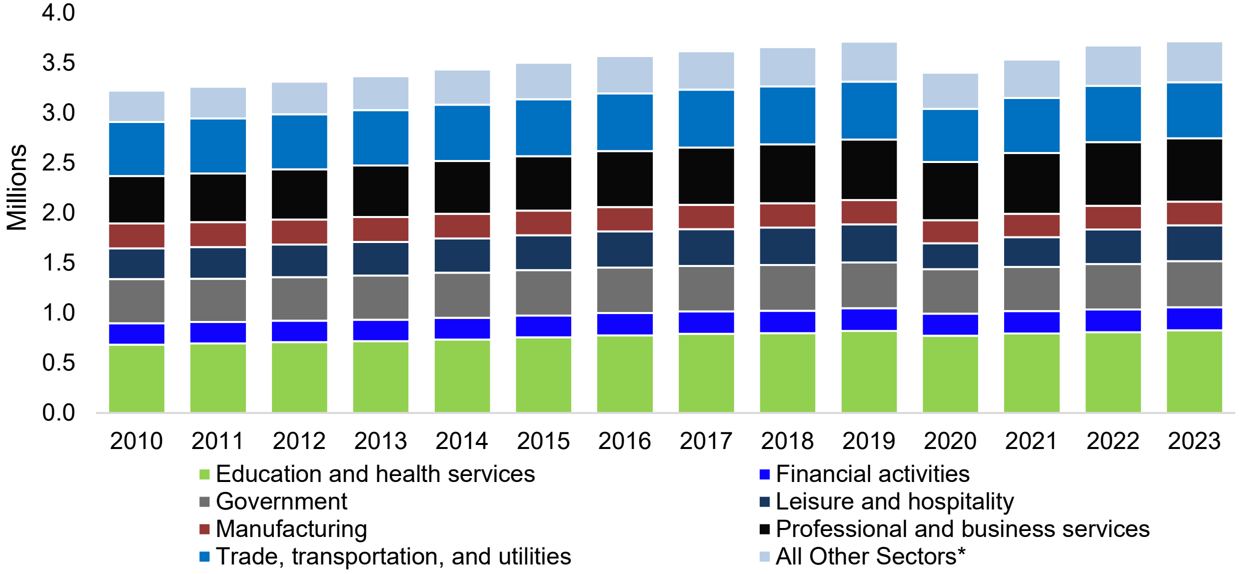
Source: U.S. Bureau of Labor Statistics, as of May 2024 (*https://www.bls.gov/sae/data/*)
Source: U.S. Bureau of Labor Statistics, as of May 2024 (*https://www.bls.gov/web/empsit/ceseeb1b.htm*)
Notes: Not seasonally adjusted

Credit Factors | Strong, Diverse, and Resilient Economy

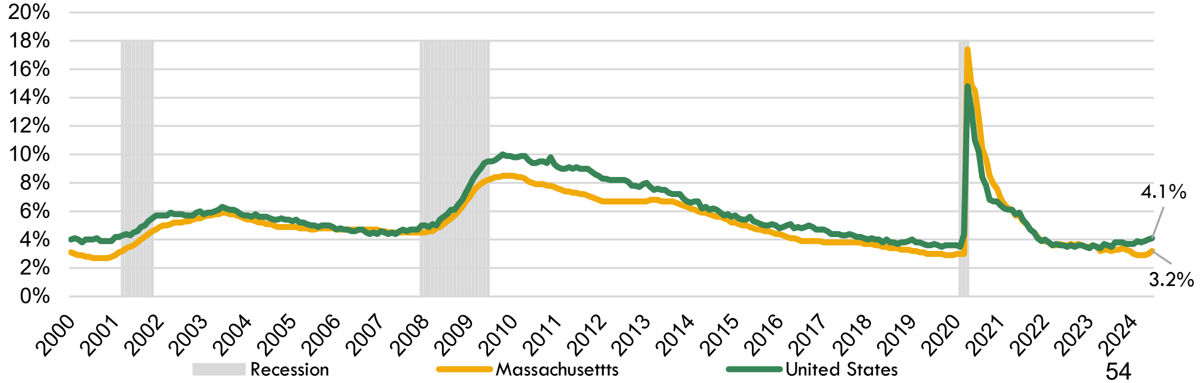
Key Takeaways

- The Massachusetts economy has generally performed better than the US economy, with the Commonwealth unemployment rate typically below the national rate – especially during and following the period of the Great Recession
- The Commonwealth's mix of knowledge-based industries and a well-educated workforce, with over 46% of all residents 25 years of age or older earning a bachelor's degree or higher, led to high levels of labor force participation and low levels of unemployment in the Commonwealth
- The early outbreak of COVID-19 in the northeastern part of the US, coupled with proactive social distancing efforts by the Commonwealth in the spring and summer of 2020, led to significant job losses
- Massachusetts' unemployment rate peaked at 17.4% in April 2020, while US unemployment peaked at 14.8% in the same month
  - Unemployment continued to fall in 2024 and stood at 3.2% in June 2024 for the Commonwealth and 4.1% for the US, surpassing pre-pandemic employment levels in the Commonwealth
- The higher-paying industries of Professional & Business Services have both returned to well above their respective pre-pandemic employment levels

Annual Average Employment in Massachusetts, 2010-2023 by NAICS Supersector [1]



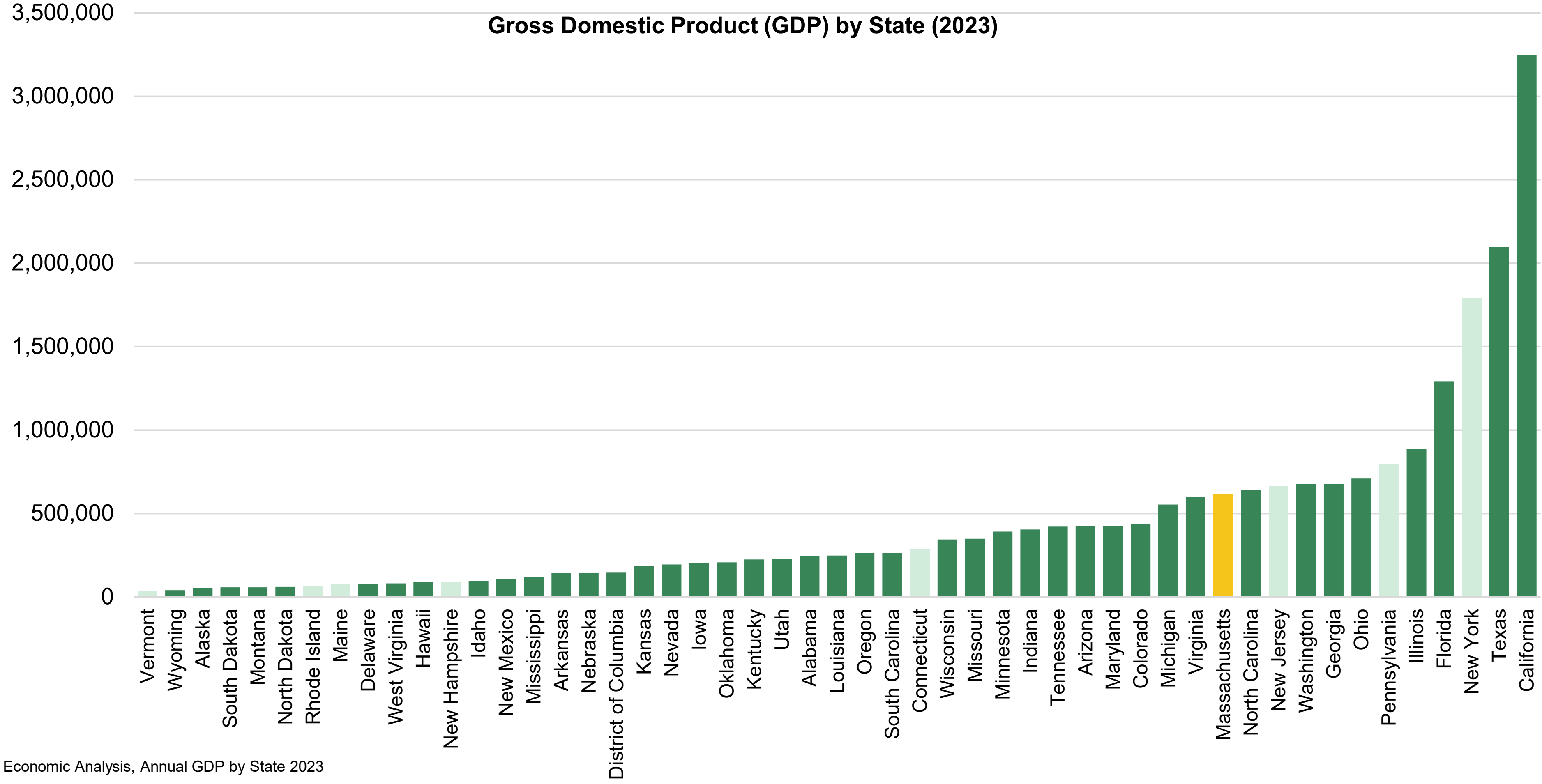
Unemployment Rates in Massachusetts and the United States as of June 2024 (Seasonally Adjusted) [2]



[1]Source: Commonwealth of Massachusetts Information Statement dated May 9, 2024 – Exhibit A Socioeconomic Indicators for Massachusetts
*Includes Mining & Natural Resources, Construction, Information, and Other Services
[2] *Source: U.S. Bureau of Labor Statistics, *seasonally adjusted as of June 2024*

Credit Factors | Strong, Diverse and Resilient Economy (cont.)

MA GDP ranked 12th among states in 2023 and 15th in state population.



Source: U.S. Bureau of Economic Analysis, Annual GDP by State 2023

Credit Factors | Consistent Per Capita Income Growth, Outpacing the Country

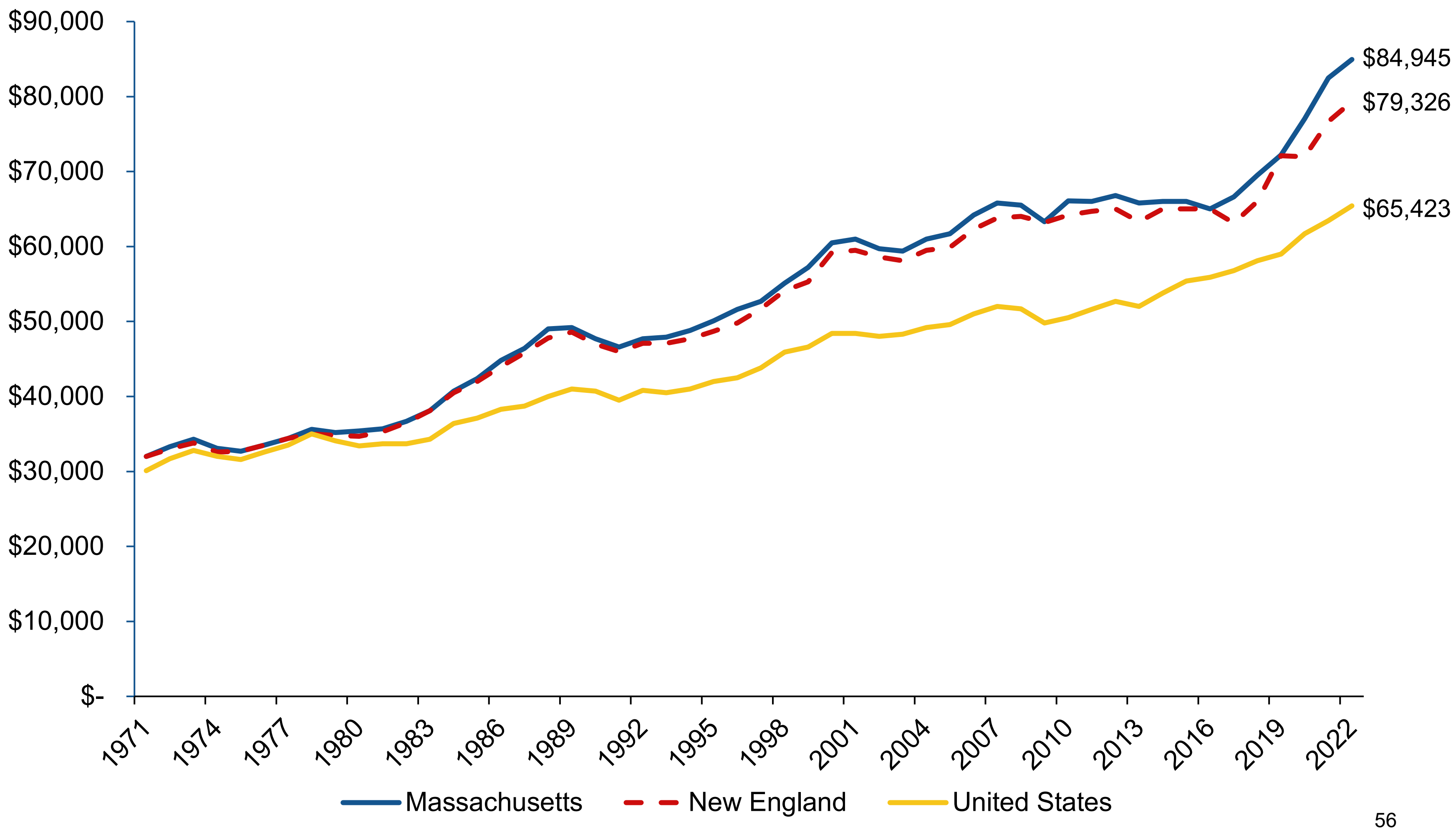
Key Takeaways

- Massachusetts has consistently been near the top of the nation in resident income and ranks as one of the wealthiest states based on mean household income and per capita income

- In 2022, the Commonwealth's real per capita personal income of $84,945 was 130% of the US' real per capita personal income

- **Strong income levels help support relatively high debt levels.**

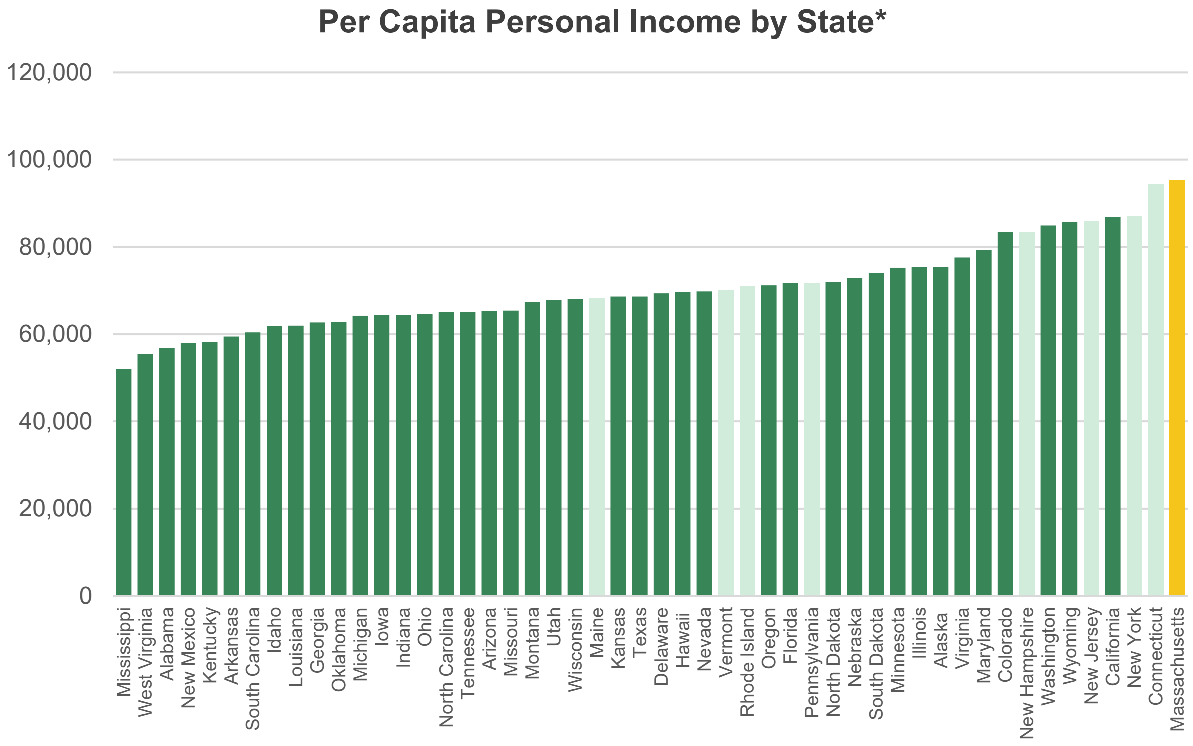
Real Per Capita Personal Income in Massachusetts, New England, and the United States, 1971-2022

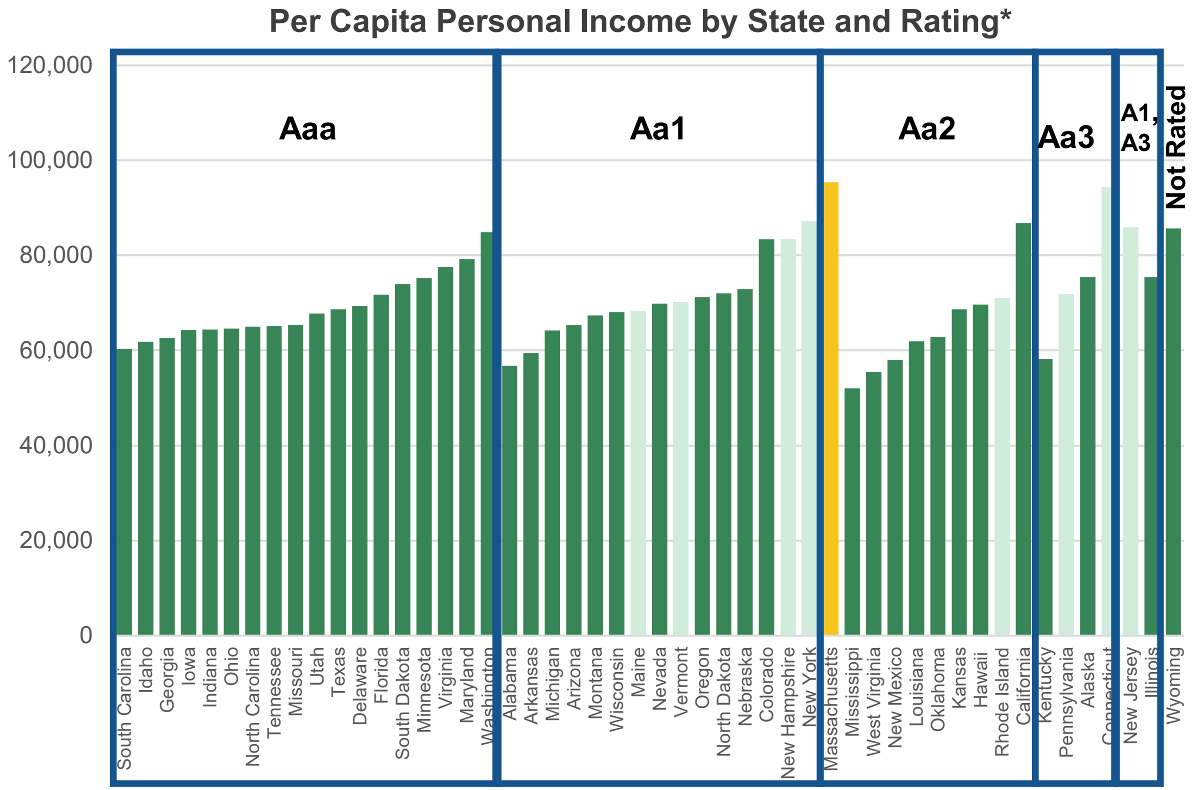


Source: Commonwealth of Massachusetts Information Statement dated May 9, 2024 – Exhibit A Socioeconomic Indicators for Massachusetts

Credit Factors | Consistent per Capita Income, Outpacing the Country (cont.)

The Commonwealth's personal income levels have consistently ranked at the top of the nation. Per capita income in was roughly 130% of the national level.





Source: U.S. Bureau of Economic Analysis

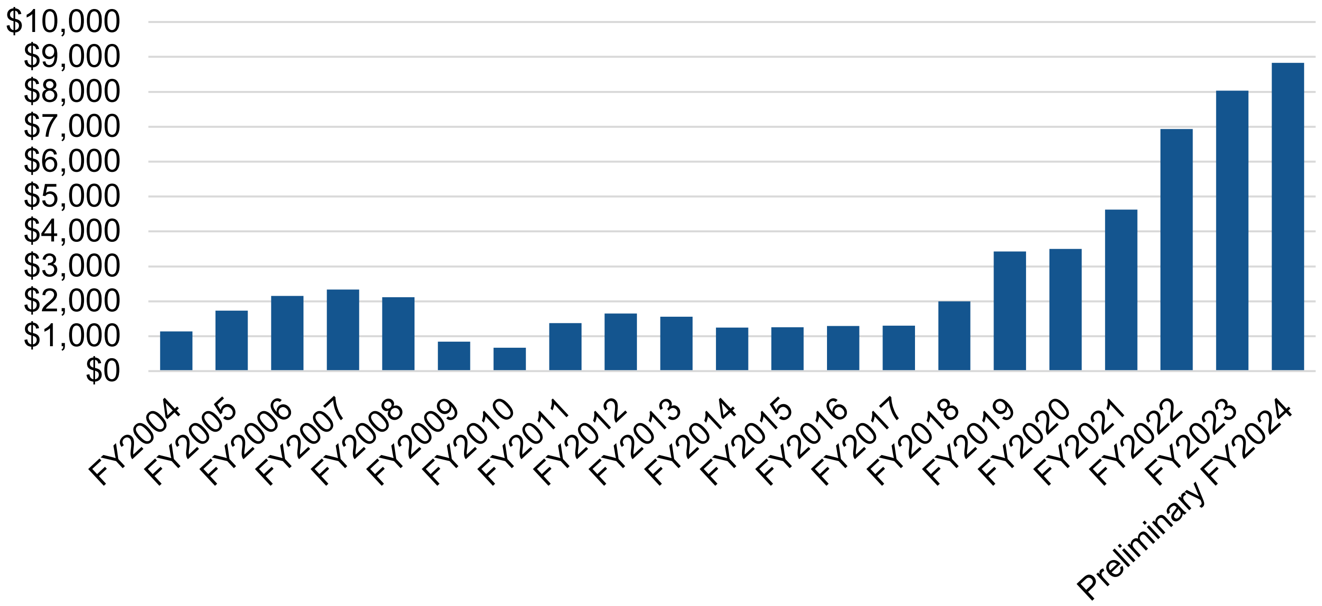
*2nd Quarter 2024 data

Credit Factors | Commitment to Building the Stabilization Fund

Stabilization Fund Sources and Uses ($ millions)

	FY2019	FY2020	FY2021	FY2022	FY2023	Preliminary FY2024
Beginning Fund Balance	$2,001	$3,424	$3,501	$4,626	$6,938	$8,036
Capital gain tax transfer*	764	-	1,098	2,273	750	344
Investment income	53	62	9	-	266	420
Deposits of remaining consolidated net surplus	593	-	-	-	--	-
Other Revenues	13	15	18	39	82	26
Ending Fund Balances	$3,424	$3,501	$4,626	$6,938	$8,036	$8,831

Massachusetts Stabilization Fund Balance ($ millions)[2]



Key Takeaways

- From $2.0 billion in FY 2018, the Stabilization Fund balance has increased by roughly 341% to a preliminary $8.8 billion[1] for FY2024.
- The Commonwealth has demonstrated its commitment to rebuild its reserves as stipulated through its own fiscal policies
- Capital gains tax revenues exceeding a specific threshold are required to be transferred as follows - 90% to SF, 5% to State Retiree Benefits Trust Fund (“SRBTF”) (OPEB) and 5% to Pension Liability Fund (“Pension”)
- In September 2024, legislation passed utilizing interest earnings from the Stabilization Fund to fund a Capital Investment and Debt Reduction Fund that would support state match contributions for the purposes of competing for federal discretionary grant opportunities as well as other capital investments

* Legislation enacted in 2020 retained all FY 2020 capital gains tax revenues in the General Fund due to COVID-19

[1] Source: Commonwealth of Massachusetts Information Statement dated May 9, 2024
[2] Source: Office of the Comptroller as of August 9th, 2024 (CTHRU Stabilization Rainy Day Fund | CTHRU (socrata.com))

Credit Factors | Governmental Framework

Statutory Fiscal Discipline

Consensus Revenue Forecasting

- The Administration and Legislature must publicly collaborate on tax forecasting, with expert input. M.G.L. c. 29, s. 5B. The Commonwealth uses internal resources and outside economic forecasting firms to develop the consensus revenue forecast

Balanced Budget Requirement

- The Budget must be balanced at filing and enactment, and at the signing of any appropriation act. M.G.L. c. 29, s. 6E. The Legislature and the Governor approve a balanced budget each fiscal year
- The Administration must flag and address material revenue shortfalls within days of discovery. M.G.L. c. 29, s. 9C

Statutory Buffers to Revenue Volatility

- Capital gains tax revenues collected that exceed a specific threshold are transferred – 90% to SF, 5% to OPEB and 5% to Pension Liability
- Legislature must expressly intervene if there is a need to redirect funds away from reserves. M.G.L. c. 29, s. 5G

Cash Management

- Cash flow projections are prepared and submitted quarterly to the Legislature

Institutionalized Practices

Consistent and Disciplined Budgeting Approach

- Standardized approach to budgeting for essential and predictable costs
- Demonstrated commitment to strengthen pension and OPEB by consistently increasing funding

Created a Structural Surplus

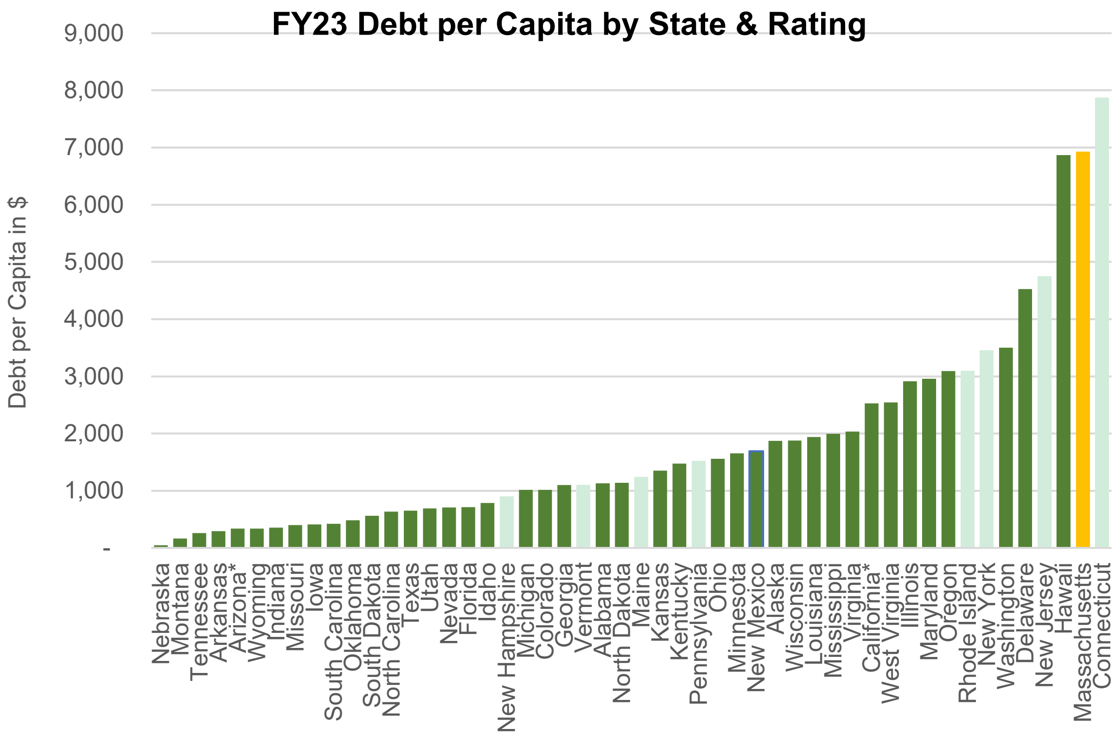
- Aligned spending and revenue growth and eliminated reliance on non-recurring revenue sources
- Buffered the budget from volatility of capital gains and used surplus funds for tax relief instead of increasing spending to maintain structural balance

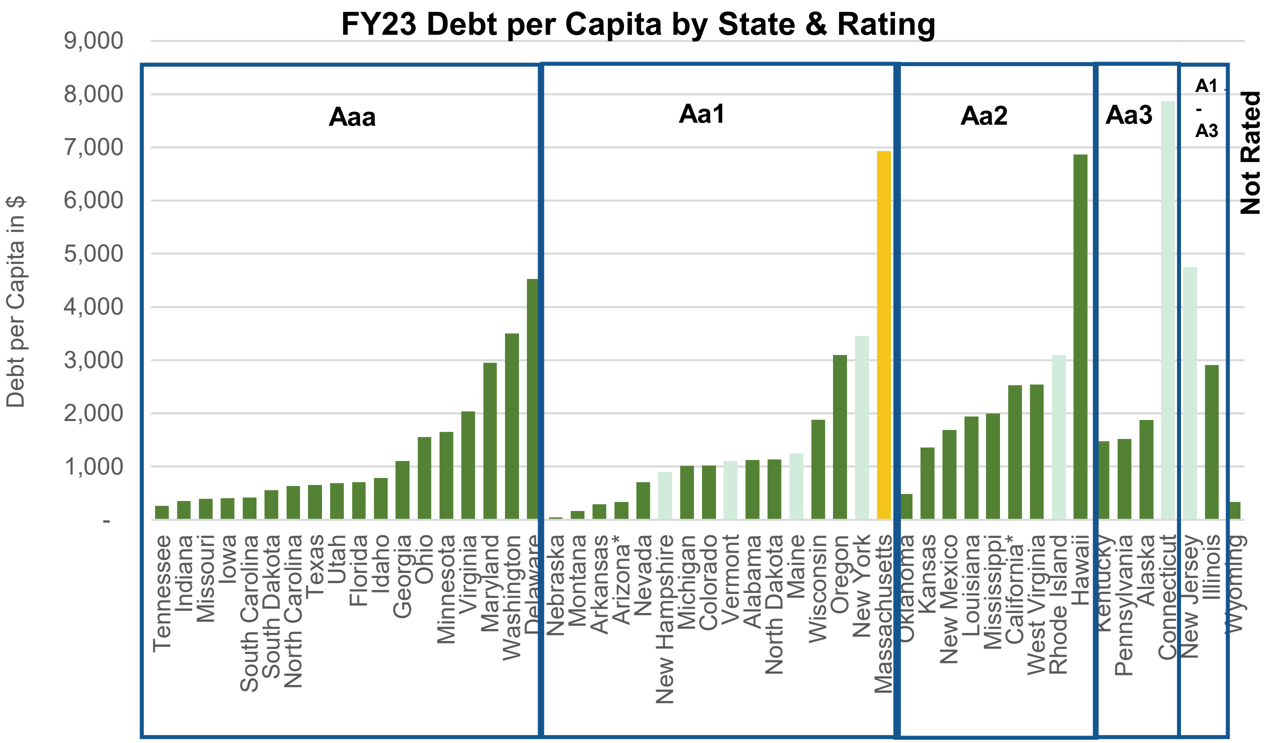
Prudent Capital Management

- Maintain statutory debt limit on debt issuance: for direct debt, the annual limit increases each year to 105% of the prior year's limit
- Established debt affordability policy sets limit on annual debt service of 8% of budgeted revenues and annual growth in bond cap to $125 million
- Debt Affordability Committee provides an estimate of total amount of new Commonwealth debt that can be prudently issued for the next fiscal year
- Annually publish 5-year Capital Improvement Plan (includes annual capital budget)
- Track record of risk mitigation and actively managing the debt portfolio through various economic cycles

Credit Factors | Long Term Liabilities - Debt per Capita

Massachusetts has elevated long term liabilities relative to its peers. Although unlike many other states, MA issues debt for both state-level and local purposes.

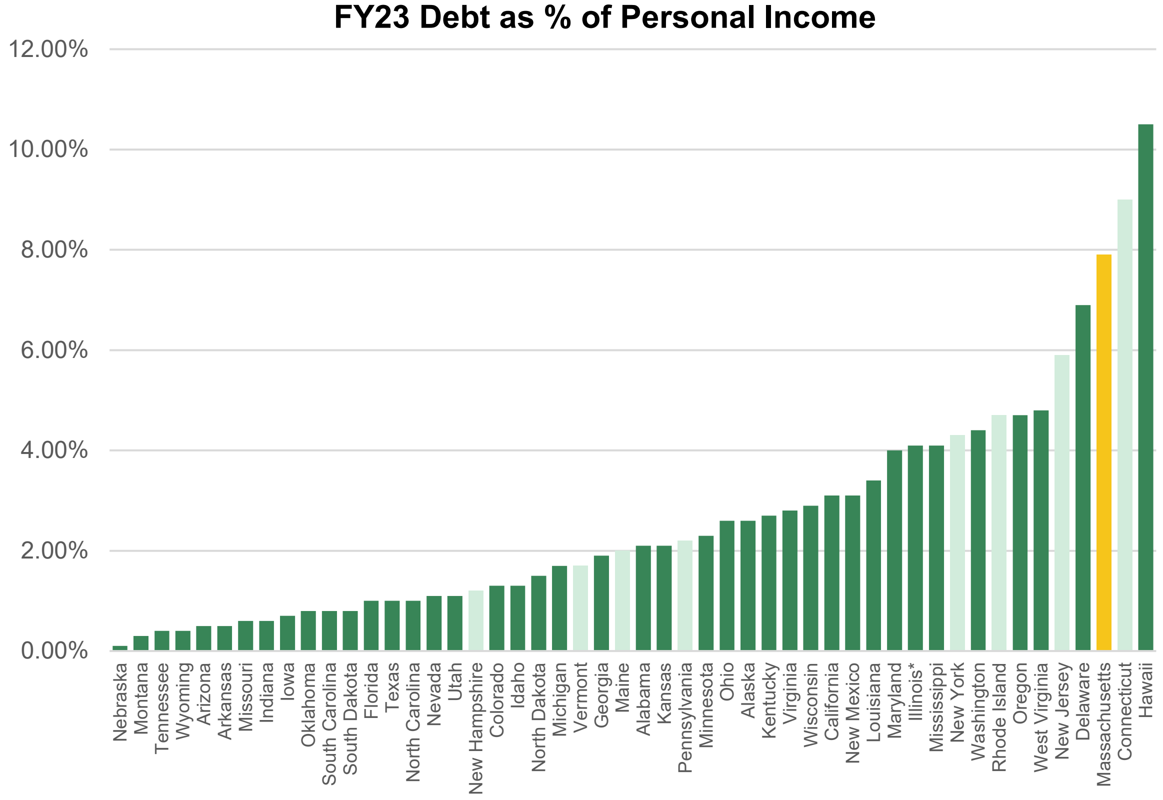


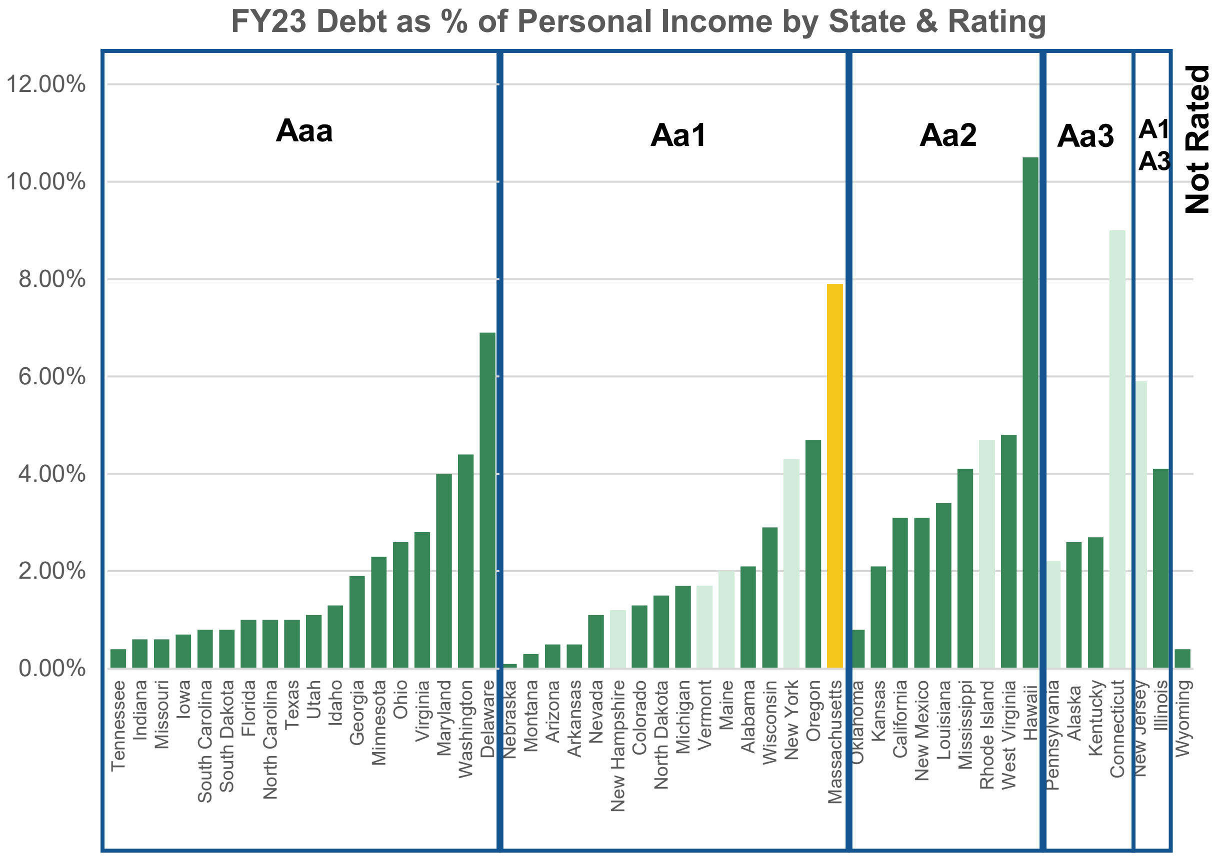


Source: U.S. Bureau of Economic Analysis, Moody's Analytics

Credit Factors | Long Term Liabilities - Debt as % of Income

Debt as a % of Personal Income by State and Rating (2023)

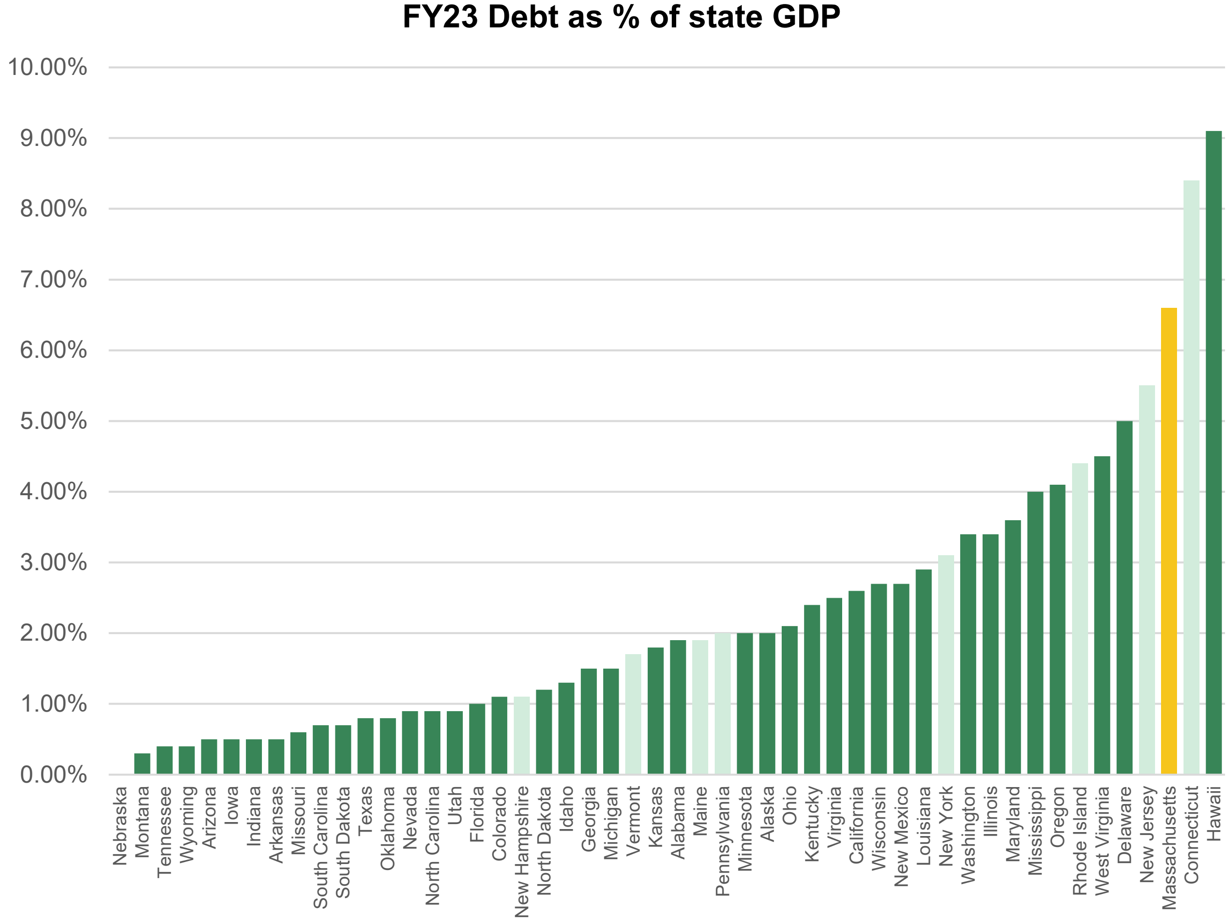




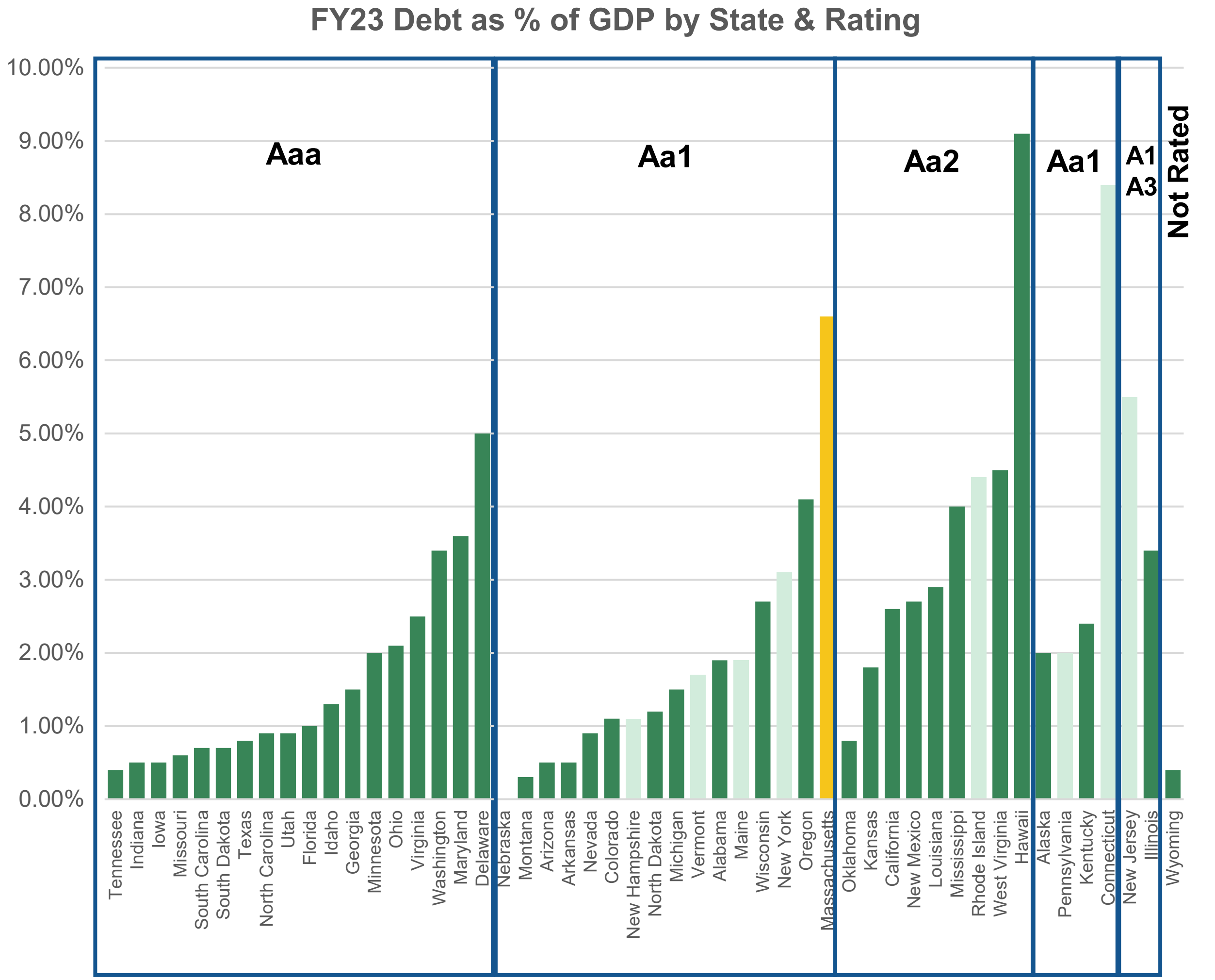
Source: U.S. Bureau of Economic Analysis, Moody's Analytics

Credit Factors | Long Term Liabilities - Debt as % of GDP

Debt as a % of GDP by State and Rating (2023)



Source: U.S. Bureau of Economic Analysis, Moody's Analytics

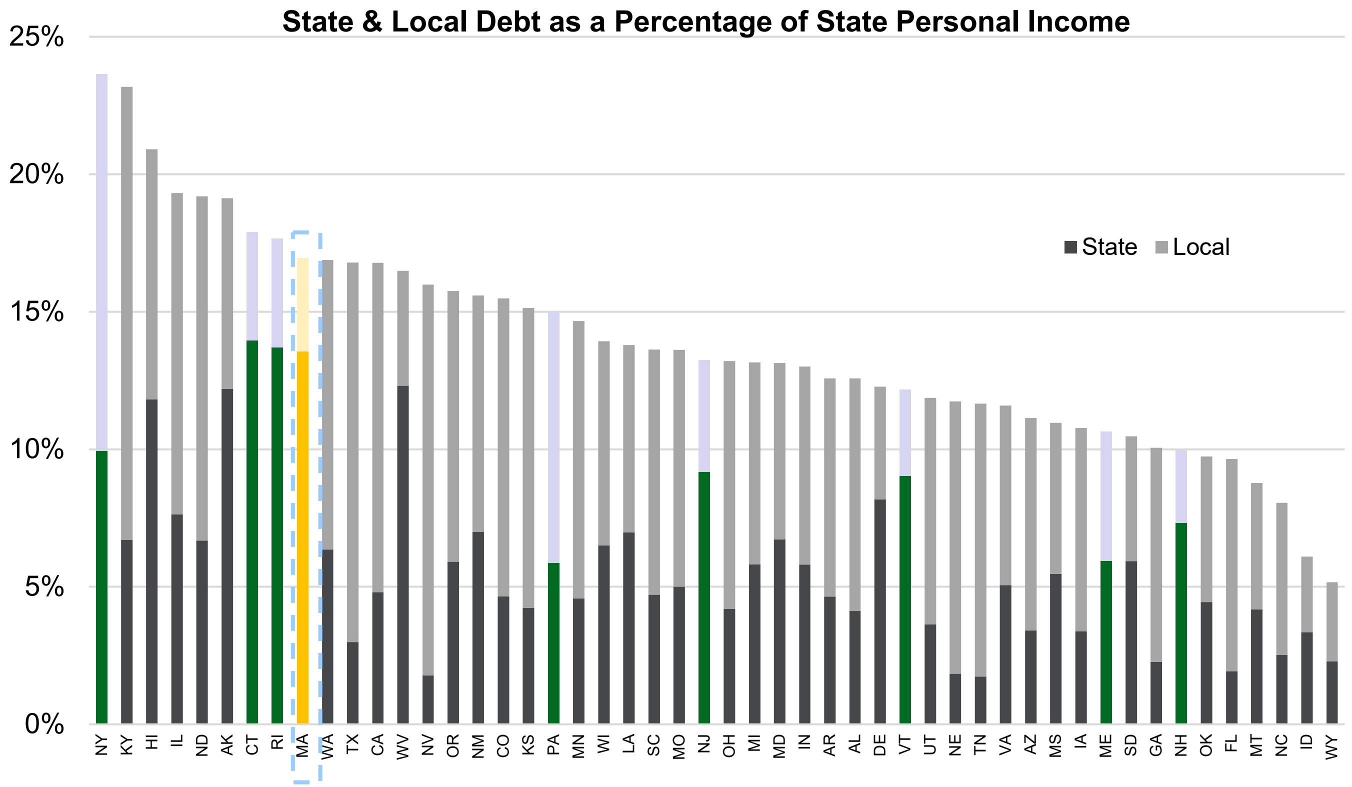


Credit Factors | Long Term Liabilities – State vs Local Investment

The Commonwealth makes substantial payments to cities, towns, and school districts to mitigate the impact of local property tax limits on local programs and services – as a result, 100% of rated municipalities carry a "A" rating or better, 98% carry a "A+" rating or better, and 90% are rated "AA" or better.

Key Takeaways

- Unlike many other state GO credits, Massachusetts issues debt for state-level and local level purposes
- However, the Commonwealth is the 4th lowest in the nation for local debt as a percentage of personal income
- **State investments in local communities a driver of elevated debt levels relative to other states**



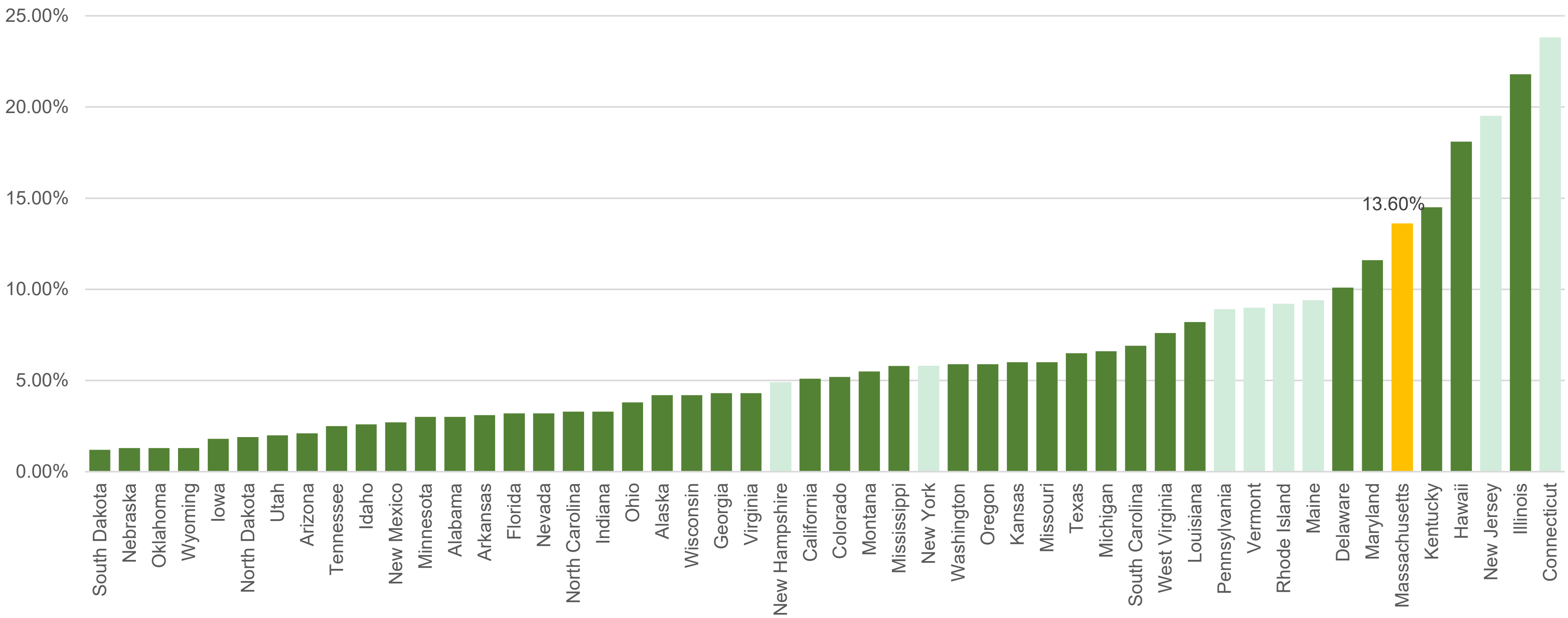
Note: Personal income data as of 2018
SOURCE: State & Local Debt from U.S. Census 2017 data

Credit Factors | Long Term Liabilities – Fixed Costs as a % of Revenue

When factoring other long-term liabilities, MA's fixed costs as a % of revenues is somewhat moderated relative to peers.

Total Long Term Liabilities as % of Revenue (2023)

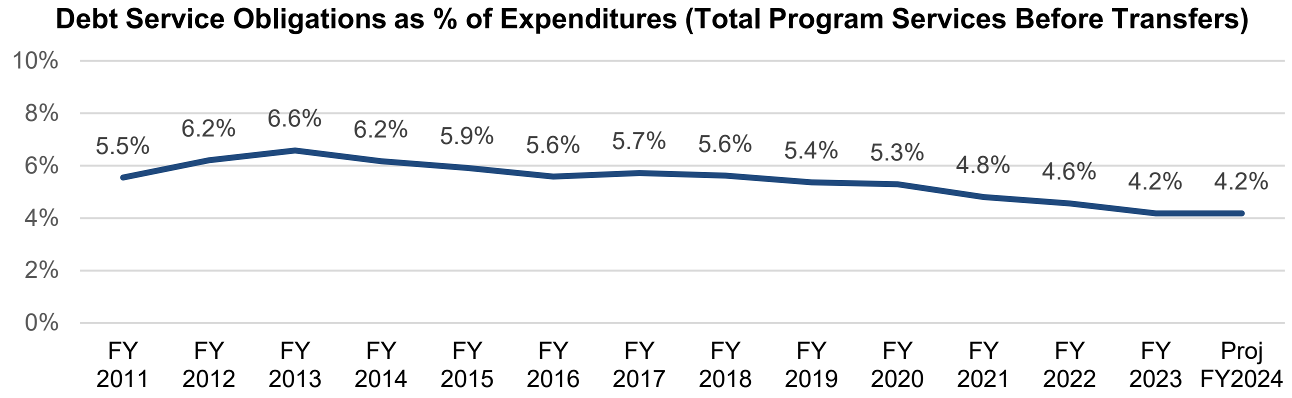
(Debt service + pension tread water payment + OPEB contribution + other long-term liabilities carrying cost) as % of state revenue



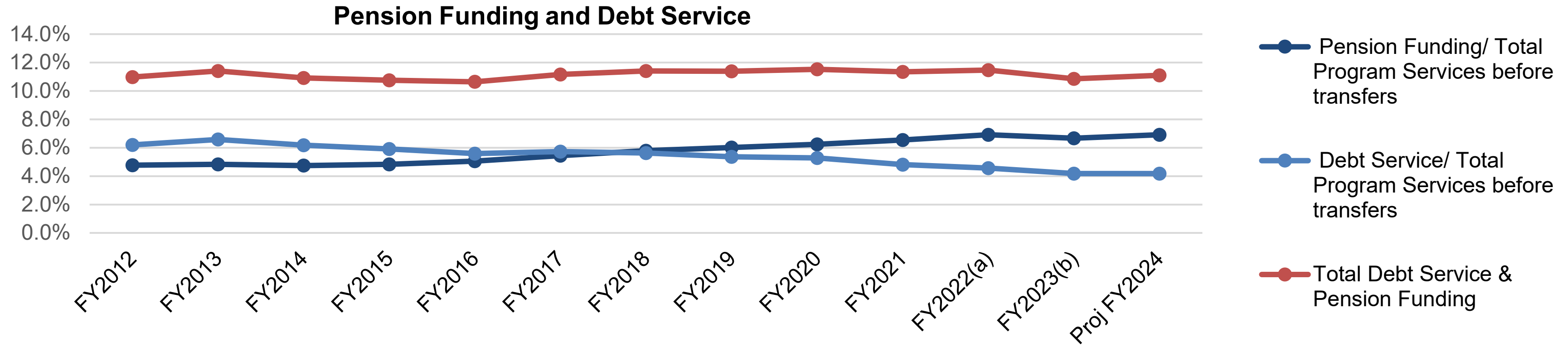
Source: Moody's Analytics

Long Term Liabilities | Debt Service and Pension Contributions

The Commonwealth's debt service obligations represent 4.2% of total expenditures in FY 2023. This is an improvement from a high of 6.6% in FY 2013.



As debt service as a % of expenditures decreased, pension funding as a % of expenditures increased. Combined, the cost of the management of these long-term liabilities has remained relatively flat.



(a) FY2022 Pension Funding includes a $250 million supplemental transfer to the Pension Liability Fund.

(b) FY2023 Pension Funding includes a $250 million supplemental transfer to the Pension Liability Fund and a further $100 million to fully pay down pension liabilities attributable to the fiscal 2015 early retirement incentive program.

Source: Commonwealth of Massachusetts Information Statement

8. Capital Investment Plan (CIP)

Debt Affordability Committee | FY25 CIP Introduction

The second Healey-Driscoll CIP, published in June 2024, focused on targeted investments in housing, economic development, and preservation of key state assets.

Fully Commit to Our Climate Goals

- Balance existing commitments to infrastructure maintenance
- Catalyze innovative initiatives to combatting climate change

Build Efficient & Effective Service Delivery

- Make robust investments in physical and technological infrastructure
- Improve climate resiliency, health and safety, and government efficiency

Invest Historic Levels in Housing Production and Preservation

- Leverage all available resources to drive housing production
- Preserve the Commonwealth's existing housing stock

Partner with Cities and Towns

- Invest in capital programs that will benefit municipalities throughout Massachusetts
- Reaffirm that statewide growth begins at the local level

Drive Economic Development

- Advance economic strategies and investments in our innovation economy
- Support economic foundations across all of Massachusetts

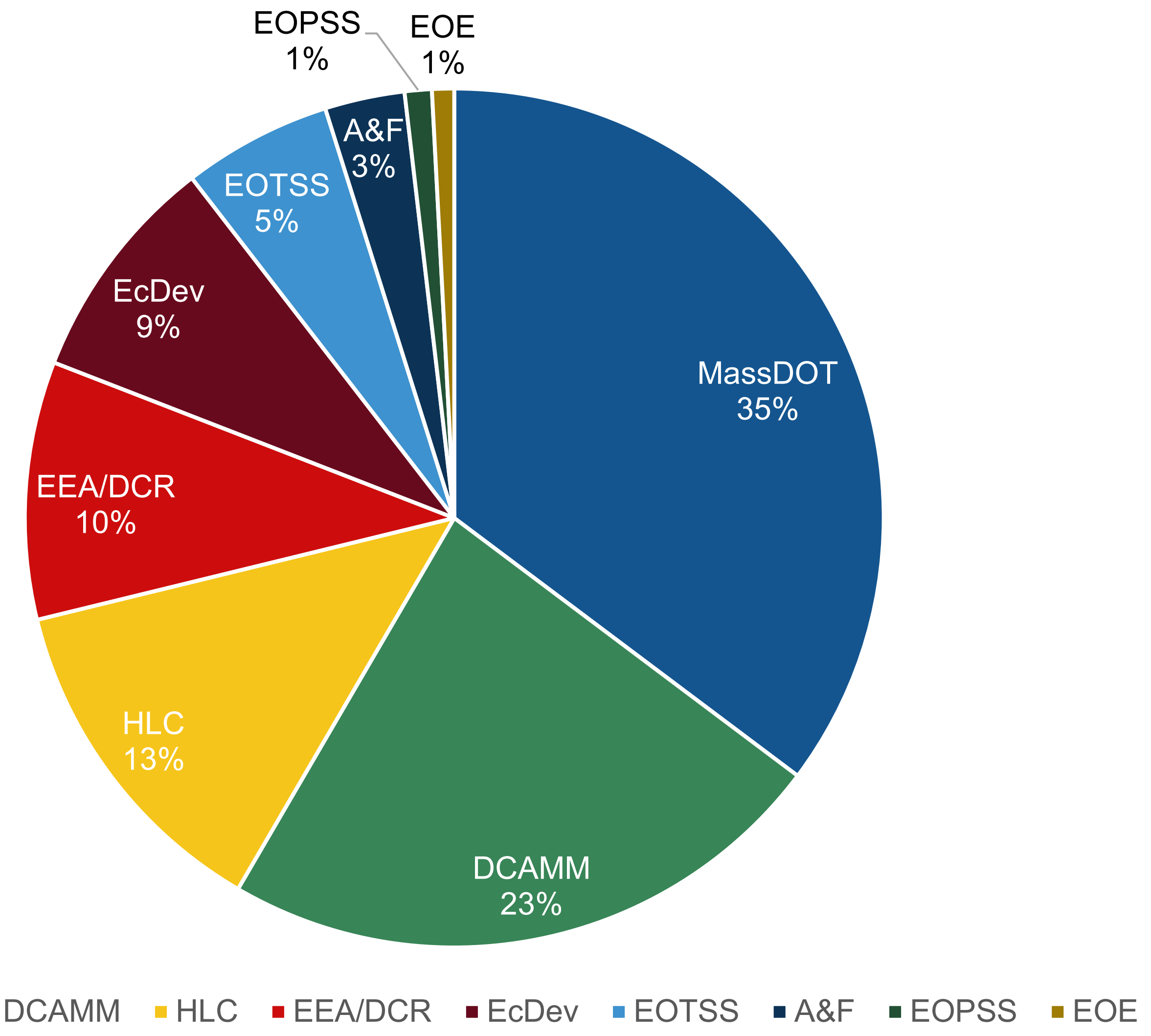
Preserve & Modernize Our Assets

- Extend Commonwealth facilities' asset life
- Minimize operating costs
- Maximize building efficiency
- Build resilience to the climate crisis

CIP | FY25 CIP Budget Summary (cont.)

FY25 CIP bond cap budget ($3.1 B) aligns with DAC recommendation.

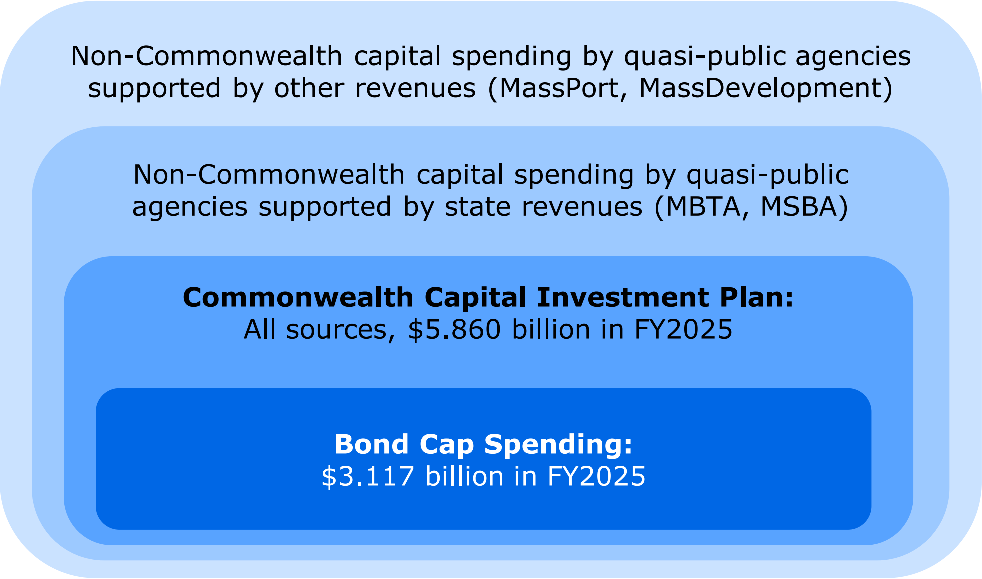
- The biggest piece of the Commonwealth's capital plan is for Transportation (MassDOT)
- Together with Facilities (DCAMM), Housing (HLC), and Energy & Environmental (EEA), these top four categories comprise **over 80% of bond cap spending**
- **Year-over-year increase of +$212.2 M** included additional +$87.2 M to address construction cost escalation



Source: Executive Office for Administration & Finance

CIP | FY25 CIP Budget Summary (cont.)

Bond cap is the majority of the CIP, funded by G.O. bonds, with other significant sources



Source	FY25 ($M)
General Obligation Bonds (bond cap)	$3,117
Federal Funds	$1,467
Special Obligation (REP and ABP) Bonds	$255
Other contributions (match, private, etc.)	$434
Pay-as-you go (PAYGO)	$434
Project / Self-Funded	$152
Capital Investment Plan Total ALL SOURCES	**$5,860**

Bond Authorization vs. Bond Cap Spending

- Bond Bills: the vehicle by which legal authorization to spend bond cap is granted; require 2/3rds roll-call vote in formal legislative session
- Authorizations allow but do not require borrowing
- All spending financed by bond bills is at discretion of Governor per Massachusetts Constitution
- The Governor-approved CIP provides the budget that funds actual bond cap spending
- DAC recommendation plays a key role in assessing how much bond cap Massachusetts can afford

Source: Executive Office for Administration & Finance

CIP | FY25 CIP Budget Summary (cont.)

DCAMM, HLC, and EcDev received largest dollar increases, reflecting Healey-Driscoll Administration commitment to addressing facilities construction escalation, increasing affordable housing, and promoting economic development.

(All figures $ M)	FY24 Bond Cap	FY25 Bond Cap	YoY Var.	YoY % Var.	Notes
MassDOT	1,137	1,099	(38)	-3%	• *Transportation: Roads, bridges, tunnels, regional transit, freight rail, aviation*
DCAMM	614	722	108	+18%	• *State facilities: Government offices, public higher education, public health, trial courts, public safety & corrections, sheriffs*
EEA / DCR	313	303	(10)	-3%	• *Energy & Environment: Environmental protection, water quality, climate resiliency, recycling, clean energy* • *Conservation & Recreation: Parks & trails, coastlines, dams, rinks & pools*
HLC	308	399	91	+29%	• *Housing: Public state-aided and private state-subsidized affordable housing*
EcDev	242	269	27	+11%	• *Economic Development: Dozens of grant programs for to promote municipal economic growth and to encourage innovation industries such as life sciences, climatetech, and other high tech*
EOTSS	162	175	13	+8%	• *Information Technology: statewide and agency-specific systems, both internal and public-facing, and cybersecurity*
A&F	72	94	22	+30%	• *Administration & Finance: Several grant programs for libraries, cultural facilities, municipal IT and ADA-compliance, and education loans*
EOPSS	31	32	1	+3%	• *Public Safety: Vehicles, equipment, and municipal grant programs for public safety equipment*
Education	26	26	0	0%	• *Education: Grant programs for vocational-technical equipment and child-care centers*
Total	**2,905**	**3,117**	**212**	**+7%**	

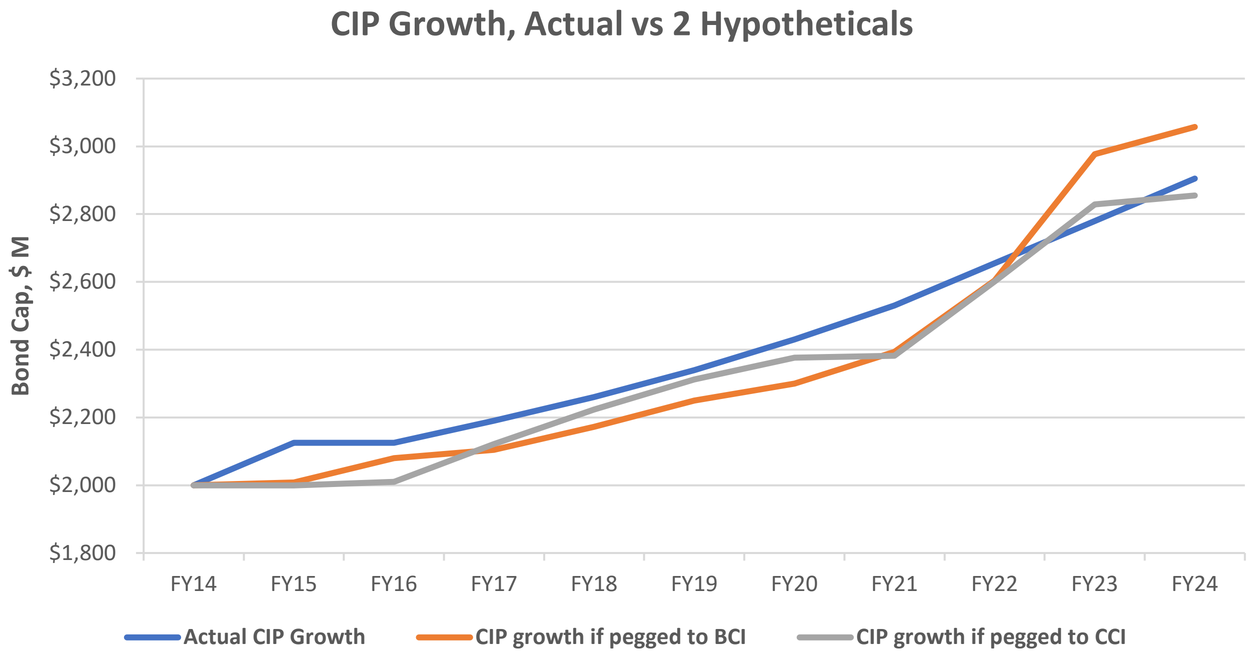
Source: Executive Office for Administration & Finance

CIP | Construction Cost Escalation

Construction escalation had outpaced CIP growth in recent years. Construction escalation has hit MA public construction projects particularly hard, with cost escalation coming in at 18% - 20% in 2022 and 2023. Recognizing this, the DAC approved an escalation adjustment in fiscal 2025.

Nationwide construction escalation has cooled, yet it continues to be a challenge within MA and continues to erode CIP bond cap's purchasing power, which has not kept up with inflation.

- ***Had CIP been indexed to BCI increases since FY14, it would have been larger in FY24 than it actually was; CCI is slightly lower***



- ***Building Cost Index (BCI):*** nationwide average construction escalation w/ skilled labor
- ***Construction Cost Index (CCI):*** nationwide average construction escalation w/ common labor

Fiscal Year	ENR Building Cost Index	Annualized Building Cost Increase
2024*	10325.97	2%
2023	10109.61	3%
2022	9845.05	14%
2021	8609.48	9%
2020	7915.45	4%
2019	7604.43	2%

Source: Engineering News Record (ENR) Cost Indices
** New data since last year*

CIP | Construction Cost Escalation

BCI and CCI are <u>nationwide</u> cost indices, but Massachusetts has consistently seen escalation above national average. DCAMM's consultants found CY 2023 <u>statewide</u> construction escalation* in tight range between 7% & 8%.

City	Zip Codes	% Increase 2023
Boston	020-022, 024	7.48%
Brockton	23	7.38%
Buzzards Bay	25	7.84%
Fall River	27	7.76%
Fitchburg	14	7.60%
Framingham	17	7.32%
Greenfield	13	7.83%
Hyannis	26	7.88%
Lawrence	19	7.27%
Lowell	18	7.33%
New Bedford	27	7.48%
Pittsfield	12	7.79%
Springfield	010-011	7.75%
Worcester	015-016	7.33%

MA Construction Escalation Recap

- **National construction industry, in general, experienced high rates of cost escalation over the past five years.**
- **However construction escalation in MA has been particularly high, with agencies reporting construction cost increases coming in higher than 3rd party cost estimators and national averages.**
- **DCAMM found MA has experienced unprecedented escalation over the past 2 years driving by a numbers of factors. Key takeaways from that report include:**
    - Costs for public projects in Massachusetts increased **18 - 20%** in 2022 and 2023. Smaller and less attractive projects escalation was higher coming in at +25%.
    - Very large increases in multiple construction commodities were the most significant driver of costs.
    - Unprecedented raw commodity increases and severe product shortages led to substantial price increases for manufactured products (e.g. generators, switchgear, roofing, drywall, steel products).
    - User requests and building/energy code changes added to increased costs especially for new construction.
    - Demand for construction contractors is high – many projects competing for small subcontractor pool. Market conditions have added 5-10% to construction costs.

* Index data is weighted average of escalation in specific trades and cost inputs: demolition, concrete, masonry, metals, wood, thermal & moisture protection, openings, finishes, fire suppression, plumbing, HVAC, electrical, communications, utilities, contractor equipment