

# 2024 FGFOA School of Governmental Finance

October 23, 2024



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Markets

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**SECTION I:**

**Overview of Municipal Bonds**



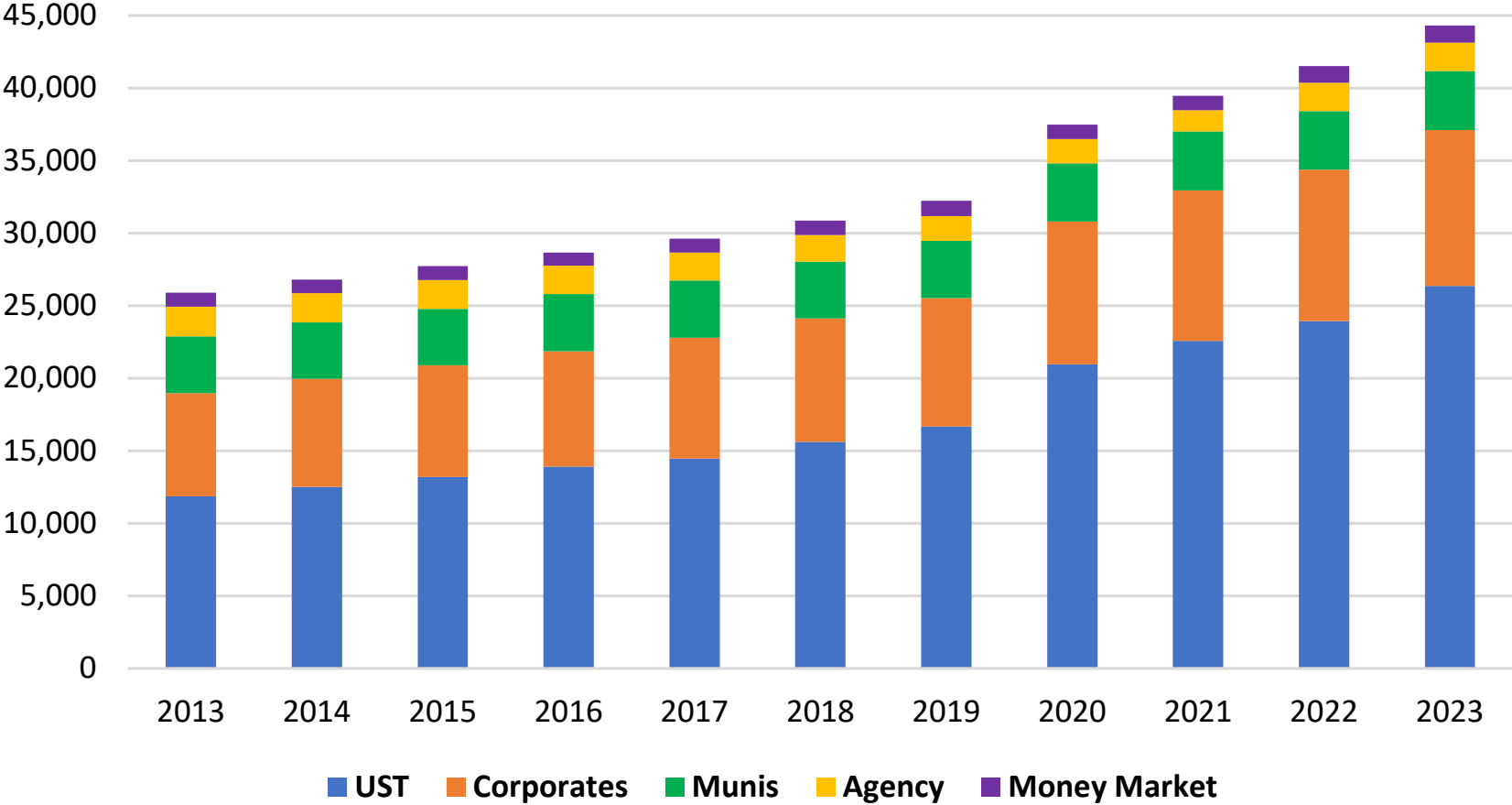
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## What is a Municipal Bond?

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- A municipal bond is a debt instrument issued by a state, local government, agency or special district
- Municipal bonds can be issued as tax-exempt, taxable, or subject to AMT (private activity bonds)
- Interest earned on **tax-exempt municipal bonds** is exempt from federal income tax and, in some cases, state and local income tax; hence, resulting in lower interest rates for state and local government borrowers
- Interest is traditionally paid semi-annually with annual principal payments
- Municipal bonds are typically secured and paid from taxes (as valorem taxes, sales tax, gas tax, etc.) or user fees (water and sewer, electric, tolls, etc.)
- Commonly used municipal bonds in Florida:
  - General Obligation (property tax / ad valorem tax – requires voter approval)
  - Revenue (utility revenues, sales tax, tolls, airport, seaport, hospital, university, etc.)
  - Certificates of Participation (leased back subject to annual appropriation)
- Short-term municipal bonds are referred to as Notes (TANs, BANs, RANs)
- Municipal bonds can be issued as fixed rate or variable rate (VRDBs, FRNs)

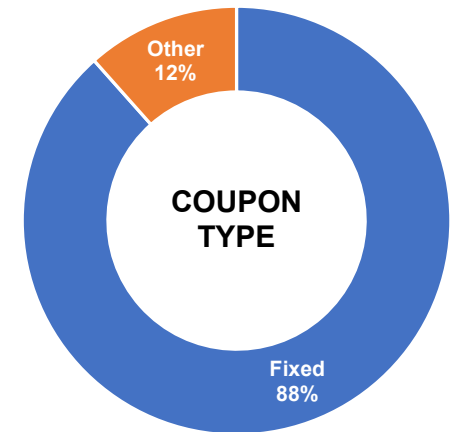
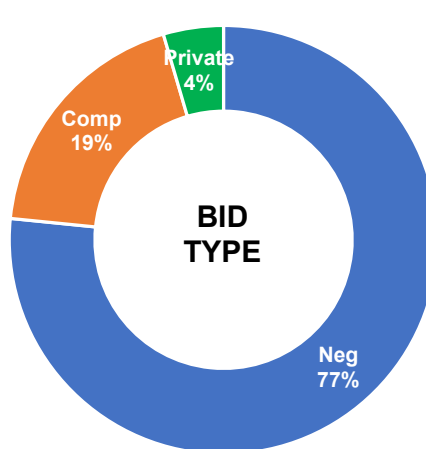
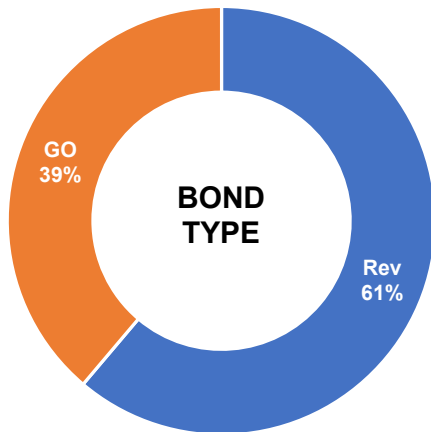
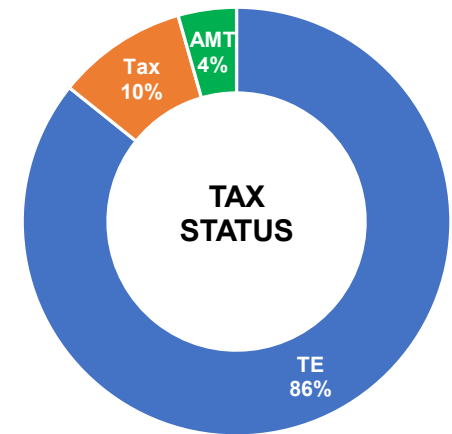
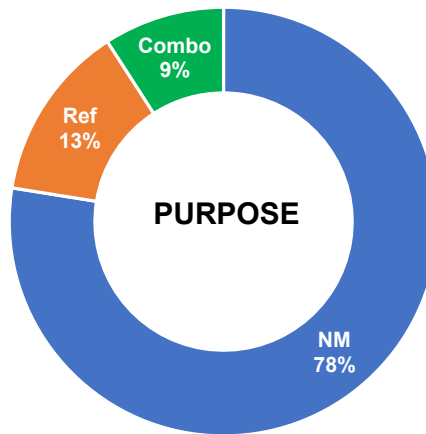
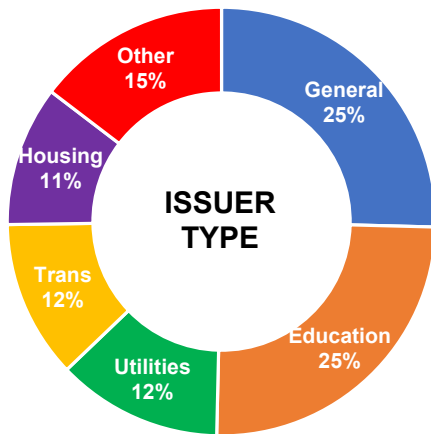
### U.S. Fixed Income Securities (in \$billions)



Source: SIFMA

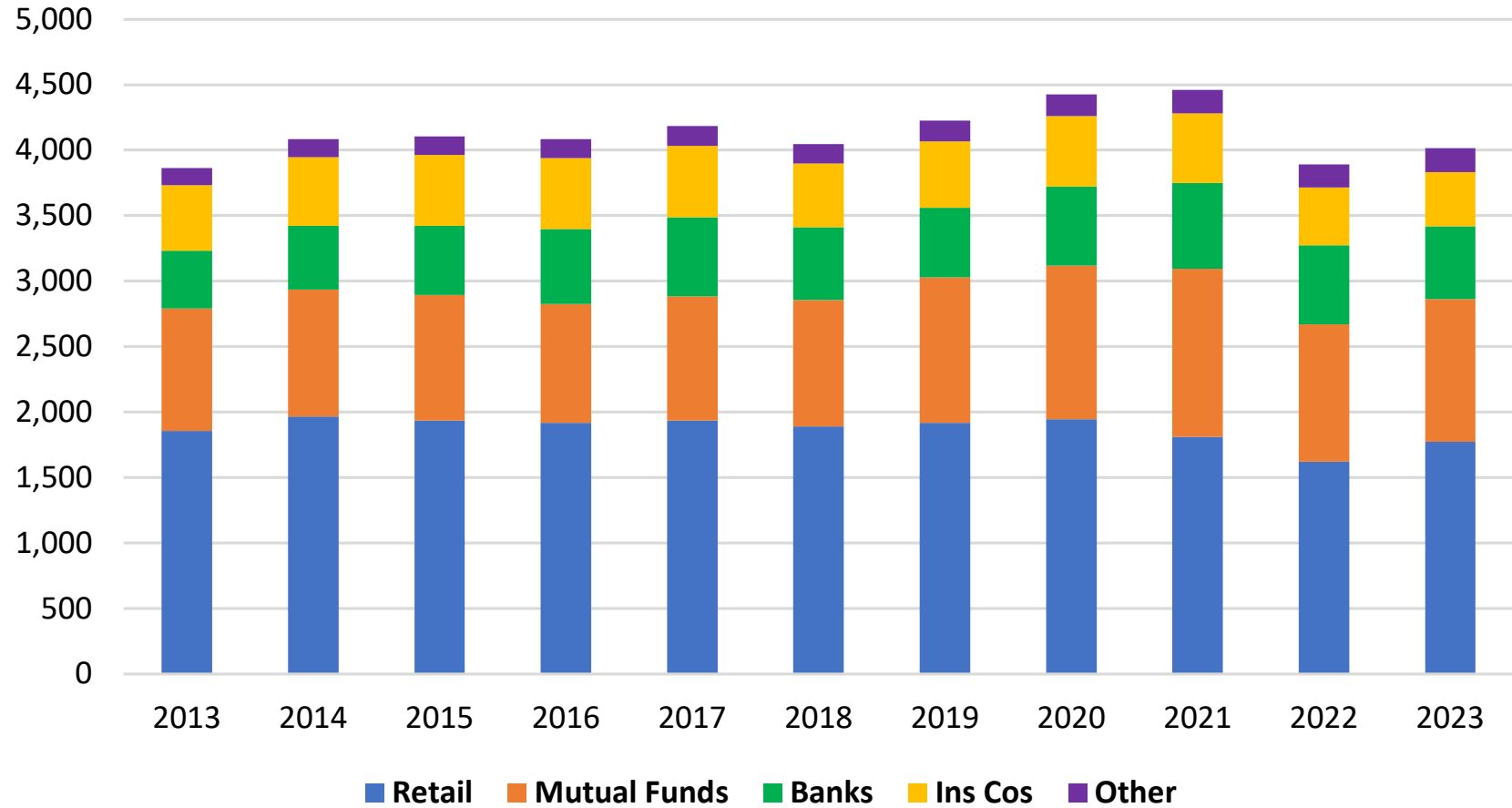
## Overview of Municipal Bond Market

- Over 80,000 state and local issuers across the U.S. with ~\$4 trillion in outstanding debt; smallest of the three major U.S. bond markets (UST = ~\$25 trillion, Corporate = ~\$10 trillion)
- Active secondary market with 13.1 million trades reported in 2023
- \$380 billion in issuance in 2023, consisting of:



Source: The Bond Buyer / SIFMA

### Holder of U.S. Municipal Bonds (in \$billions)



Source: SIFMA



## What Do Investors Buy Tax-Exempt Municipal Bonds?

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- Tax Advantage of Municipal Bonds

- Most municipal bonds issued are tax-exempt; meaning that investors don't pay federal income tax (state and local income tax in some cases) on the interest earned from holding the bonds

$$\text{Taxable Equivalent Yield} = \frac{\text{Tax-Exempt Yield}}{(1 - \text{Tax Bracket})}$$

### **Corporate Investor**

4.25% Tax-Exempt Yield

21% Tax Bracket

$$\text{TX Equivalent Yield} = \frac{4.25\%}{[1 - (0.21)]}$$

$$\text{TX Equivalent Yield} = \mathbf{5.38\%}$$

- Risk Profile

- As an investor or lender, the most important consideration before investing or lending is how likely are you to get your interest and principal back
- Municipal bonds have historically had a very low level of default

## Basic Pricing Components of a Bond

- Primary Components of Bond Pricing

- **Principal / Par Amount:** Face value or amount due at maturity (typically issued on \$1,000 basis)
- **Coupon Rate:** Fixed rate paid to the investor through final maturity based on face value
- **Yield:** Current market interest rate of a bond (subject to market change)
- **Maturity:** Date in which principal payment is due
- **Current Bond Price:** Present value of future interest and principal payments discounted at the yield (typically quoted on a per \$100 basis)

Par Bond		Current Bond Price	= $\frac{C1}{(1+Y)^1} + \frac{C2}{(1+Y)^2} + \frac{C3}{(1+Y)^3} + \frac{C4}{(1+Y)^4} + \frac{C5 + Par}{(1+Y)^5}$					
Par/Principal Amount Issued:	\$1,000		<b>\$1,000.00</b>	<i>Payment Periods</i>	1	2	3	4
Coupon Rate (Fixed Rate - Payable Semiannually):	4.25%	=		\$42.50	\$42.50	\$42.50	\$42.50	\$1,042.50
<b>Yield (Current /Market Drive Rate of Return):</b>	<b>4.25%</b>			1.042500	1.086806	1.132996	1.181148	1.231347
Final Maturity:	2028							

Discount Bond		Current Bond Price	= $\frac{C1}{(1+Y)^1} + \frac{C2}{(1+Y)^2} + \frac{C3}{(1+Y)^3} + \frac{C4}{(1+Y)^4} + \frac{C5 + Par}{(1+Y)^5}$					
Par/Principal Amount Issued:	\$1,000		<b>\$988.95</b>	<i>Payment Periods</i>	1	2	3	4
Coupon Rate (Fixed Rate - Payable Semiannually):	4.00%	=		\$40	\$40	\$40	\$40	\$1,040
<b>Yield (Current /Market Drive Rate of Return):</b>	<b>4.25%</b>			1.042500	1.086806	1.132996	1.181148	1.231347
Final Maturity:	2028							

Premium Bond		Current Bond Price	= $\frac{C1}{(1+Y)^1} + \frac{C2}{(1+Y)^2} + \frac{C3}{(1+Y)^3} + \frac{C4}{(1+Y)^4} + \frac{C5 + Par}{(1+Y)^5}$					
Par/Principal Amount Issued:	\$1,000		<b>\$1,033.16</b>	<i>Payment Periods</i>	1	2	3	4
Coupon Rate (Fixed Rate - Payable Semiannually):	5.00%	=		\$50	\$50	\$50	\$50	\$1,050
<b>Yield (Current /Market Drive Rate of Return):</b>	<b>4.25%</b>			1.042500	1.086806	1.132996	1.181148	1.231347
Final Maturity:	2028							

**SECTION II:**

**Municipal Bond Market Update**



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# Interest Rate Forecasts – RBC Economics and Bloomberg Consensus

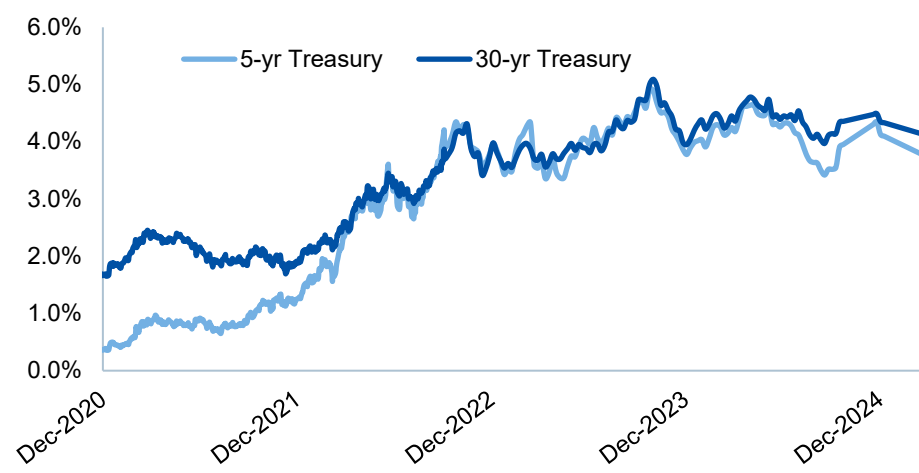
## RBC Economics U.S. Interest Rate Forecast - October 2024

End of Quarter	Actual							Forecast				
	23Q1	23Q2	23Q3	23Q4	24Q1	24Q2	24Q3	24Q4	25Q1	25Q2	25Q3	25Q4
<b>Fed funds</b>	4.88	5.13	5.38	5.38	5.38	5.38	4.88	4.38	4.13	4.13	4.13	4.13
<b>Three-month</b>	4.85	5.43	5.55	5.40	5.45	5.48	4.73	4.20	4.00	4.05	4.10	4.10
<b>Two-year</b>	4.06	4.87	5.03	4.23	4.66	4.71	3.66	4.00	4.20	4.25	4.25	4.15
<b>Five-year</b>	3.60	4.13	4.60	3.84	4.28	4.33	3.58	3.75	3.80	3.85	3.80	3.70
<b>10-year</b>	3.48	3.81	4.59	3.88	4.27	4.36	3.81	3.95	4.00	4.00	3.95	3.85
<b>30-year</b>	3.67	3.85	4.73	4.03	4.41	4.51	4.14	4.25	4.30	4.25	4.15	4.05

## Bloomberg Economic Interest Rate Forecast

Tenor	Current <sup>(1)</sup>	March 2025	Change
<b>Fed Funds Upper Bound</b>	5.00%	4.35%	<b>-0.65%</b>
<b>3-Month SOFR</b>	5.01%	4.23%	<b>-0.78%</b>
<b>5-Year Treasury</b>	3.88%	3.69%	<b>-0.19%</b>
<b>10-Year Treasury</b>	4.08%	3.87%	<b>-0.21%</b>
<b>30-Year Treasury</b>	4.39%	4.08%	<b>-0.31%</b>
<b>10 to 30-yr Spread (bps)</b>	31	10	<b>-21</b>

## Historical and Projected Treasury Yields

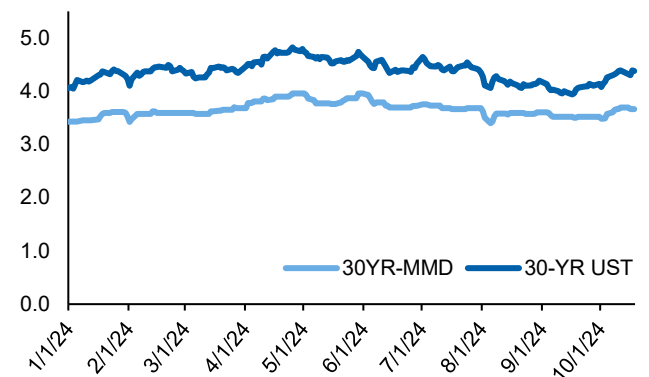
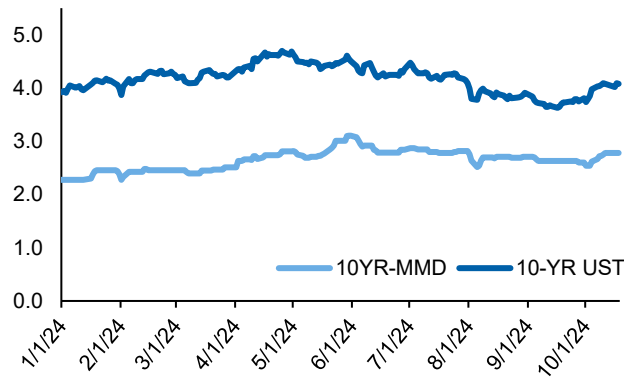
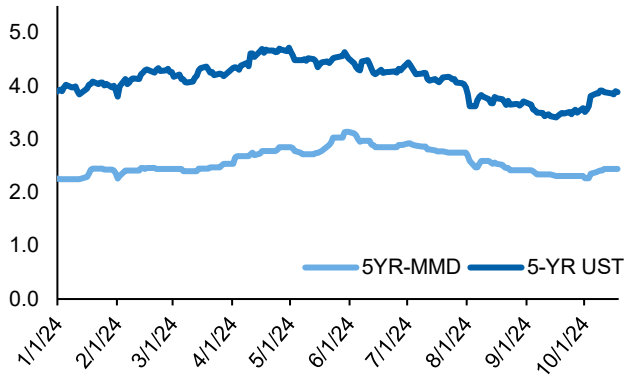


Sources: RBC Capital Markets as of October 10, 2024, [RBC Thought Leadership](#); Bloomberg as of October 14, 2024

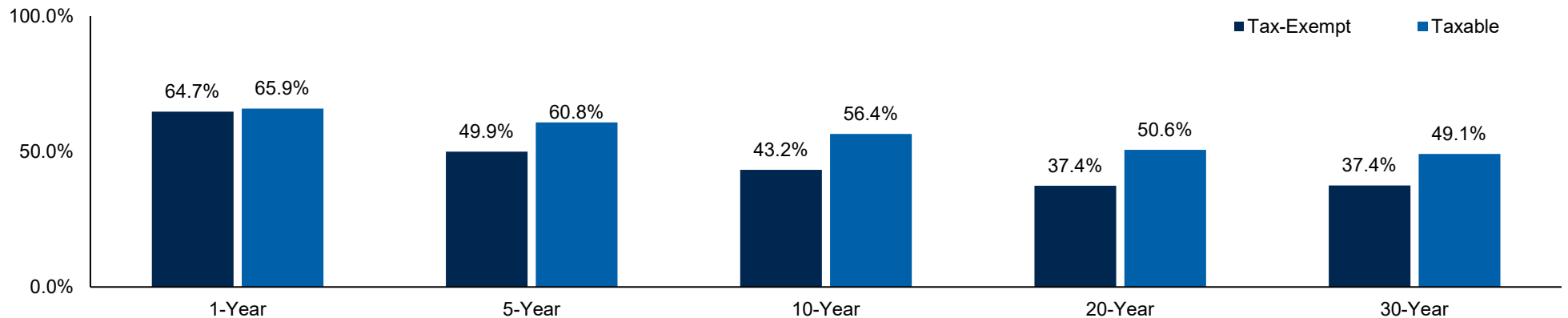
# Interest Rates are Lower Since the Beginning of 2024 with Wider Ratios

## Relative Performance of Municipals Versus Treasuries

MMD			UST			MMD / UST Ratio					
	01/02/2024	10/18/2024	Δ (bps)		01/02/2024	10/18/2024	Δ (bps)		01/02/2024	10/18/2024	Δ (%)
3yr MMD	2.35%	2.40%	5	3yr UST	4.09%	3.86%	-23	3yr Ratio	57%	62%	5%
5yr MMD	2.25%	2.44%	19	5yr UST	3.93%	3.88%	-5	5yr Ratio	57%	63%	6%
7yr MMD	2.26%	2.57%	31	7yr UST	3.95%	3.97%	2	7yr Ratio	57%	65%	8%
10yr MMD	2.28%	2.78%	50	10yr UST	3.95%	4.08%	13	10yr Ratio	58%	68%	10%
30yr MMD	3.43%	3.66%	23	30yr UST	4.08%	4.38%	30	30yr Ratio	84%	84%	-1%



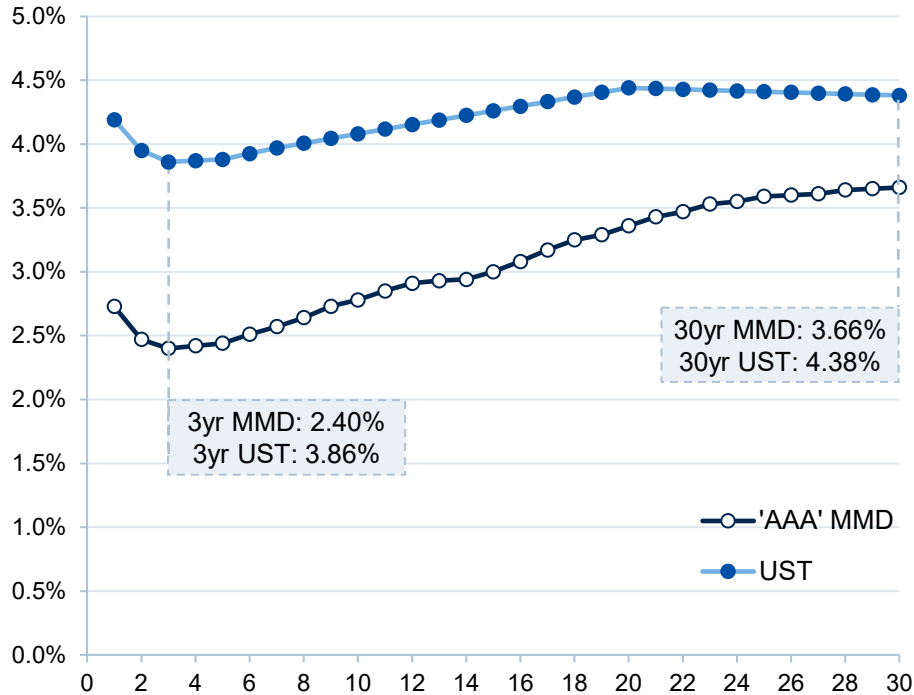
## Relative Value by Maturity Length: % of Time Rates Have Been Lower Over Past 30 Years



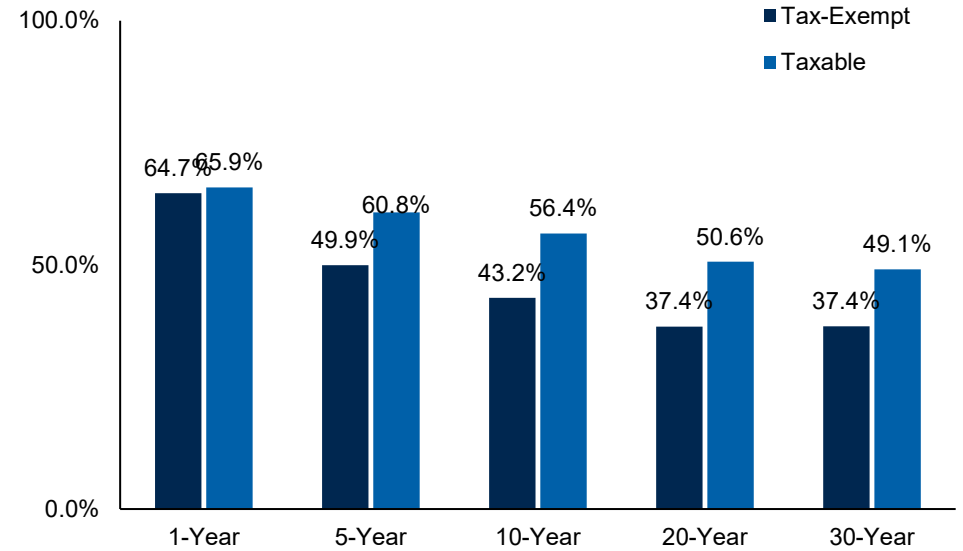
Sources: Bloomberg; Thomson Financial Municipal Market Monitor (TM3); RBC Capital Markets October 21, 2024

# Current Taxable & Tax-Exempt Markets in Historical Context

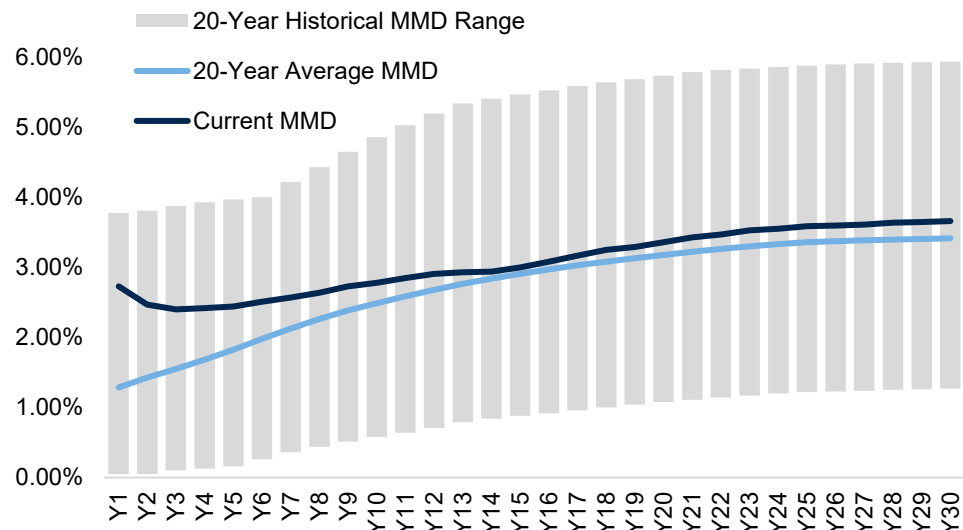
## U.S. Treasury & 'AAA' MMD Yield Curves



## % of Time Rates Have Been Lower Than Current Over Past 30 Years



## MMD Curves – 20-Year Historical Range

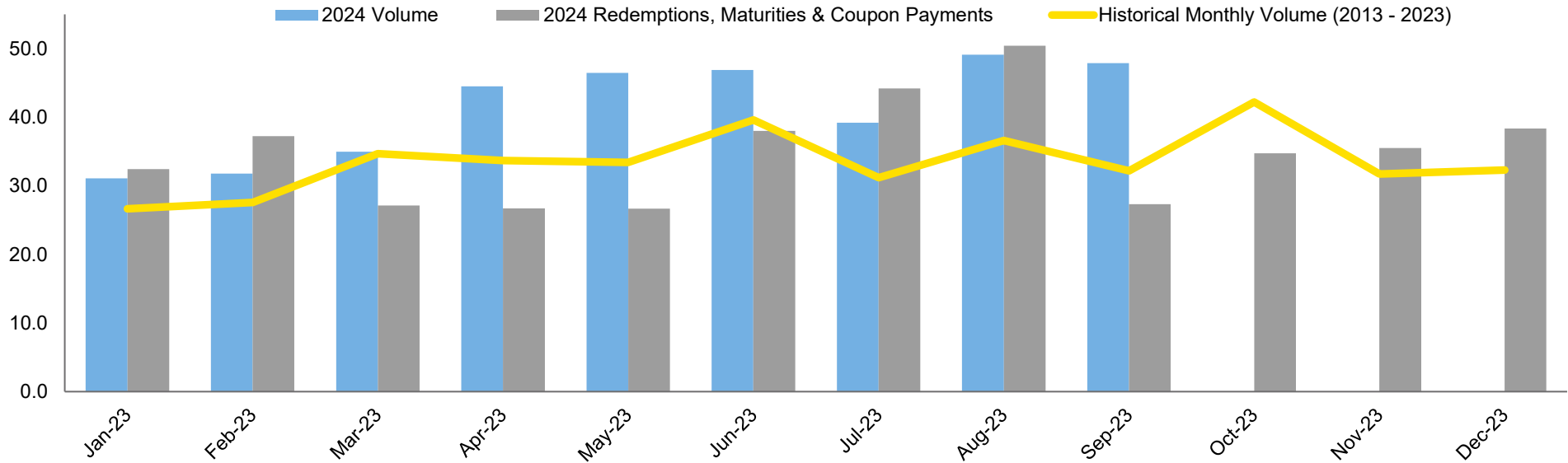


	3-Yr	5-Yr	10-Yr	20-Yr	30-Yr
<b>Tax-Exempt (MMD)</b>	2.40%	2.44%	2.78%	3.36%	3.66%
<b>Taxable (UST)</b>	3.86%	3.88%	4.08%	4.44%	4.38%
<b>MMD / UST</b>	62%	63%	68%	76%	84%

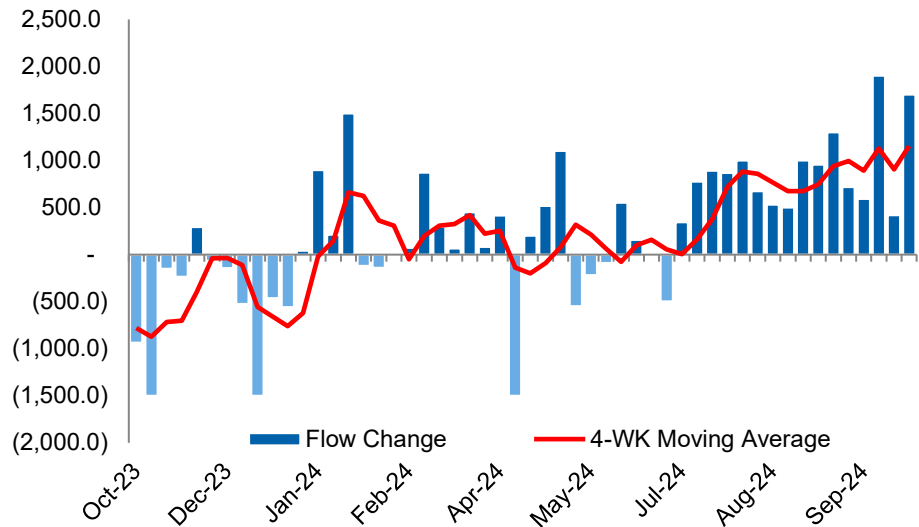
Source: Bloomberg as of October 21, 2024

# Municipal Market Themes – Bond Fund Flows and Supply Factors

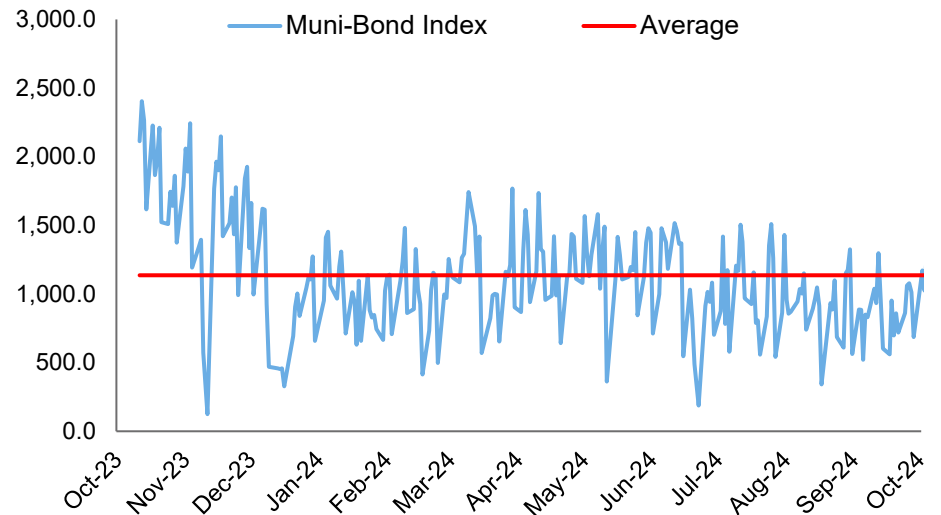
## Monthly Reinvestment Cash Versus Volume (\$ billions)



## Weekly Municipal Bond Fund Flows (\$ billions)



## Municipal Bid-Wanted (\$ billions)



Source: Bloomberg as of October 21, 2024; Lipper for the week ended October 20, 2024

## Driving Factors in the Municipal Market

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- **Investor Base**

- Today, publicly reporting investors hold approximately 37% of all outstanding municipal bonds - the remaining 63% of holdings are in the hands of investors who are not required to report
- Buyer base for tax-exempt bonds includes institutional accounts (mutual funds, insurance companies, arbitrage accounts, etc.), professional retail (SMAs), and traditional retail, to a lesser extent
- SMAs are traditionally not significant buyers of taxable or AMT debt
- With the significant growth in SMAs, taxable and AMT spreads have widened out significantly

- **Coupons**

- Current trend seems to be toward higher, more defensive coupon structures
- While 5.25% and 5.50% coupons were common on longer-dated maturities over the recent past, the decrease in interest rates has led to the return of 5.00% coupons for most maturities

- **Call Options**

- Standard 10-year par calls still appear to be preferred by investors
- 8-year and 9-year calls can be priced with minimal yield-to-call penalty, but investors generally expect a premium for calls 7-years and in

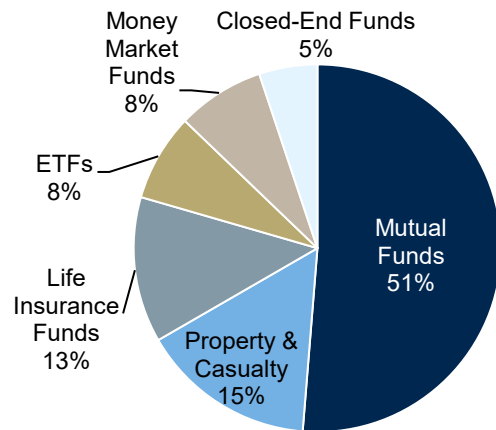


# Muni Investor Breakdown

Reporting Investors	Non-Reporting Investors
Mutual Funds	Separately Managed Accounts (SMAs)
Insurance Funds	Hedge Funds / Private Equity Accounts
ETFs	Bank Portfolios
Closed-End Funds	Arbitrage / Relative Value
-	Retail
<b>37%</b>	<b>63%</b>

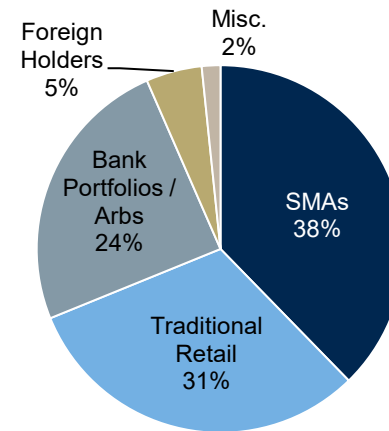
## Publicly Reporting Holders

- Historically the municipal market has been dominated by large mutual and closed end funds
- Large insurance funds have also historically played an important role in the market as munis offer an attractive hedge to life insurance annuities
- Although reporting investors used to account for a majority of the municipal investor base, their participation levels have slowly declined in recent years



## Non-Reporting Holders

- SMAs are professionally managed investment accounts that allow individuals to own securities in whole
- Most recently, SMAs have become a dominant player in the municipal market as traditional retail investors have found a new home for their capital
- The growth in SMAs has expanded the non-reporting investor base and created new challenges when identifying bondholders of individual credits



Source: RBCCM, Bloomberg, IPREO

# Muni Investor by Fund Type

## Reporting Traditional Bond Funds

## Non-Reporting SMAs



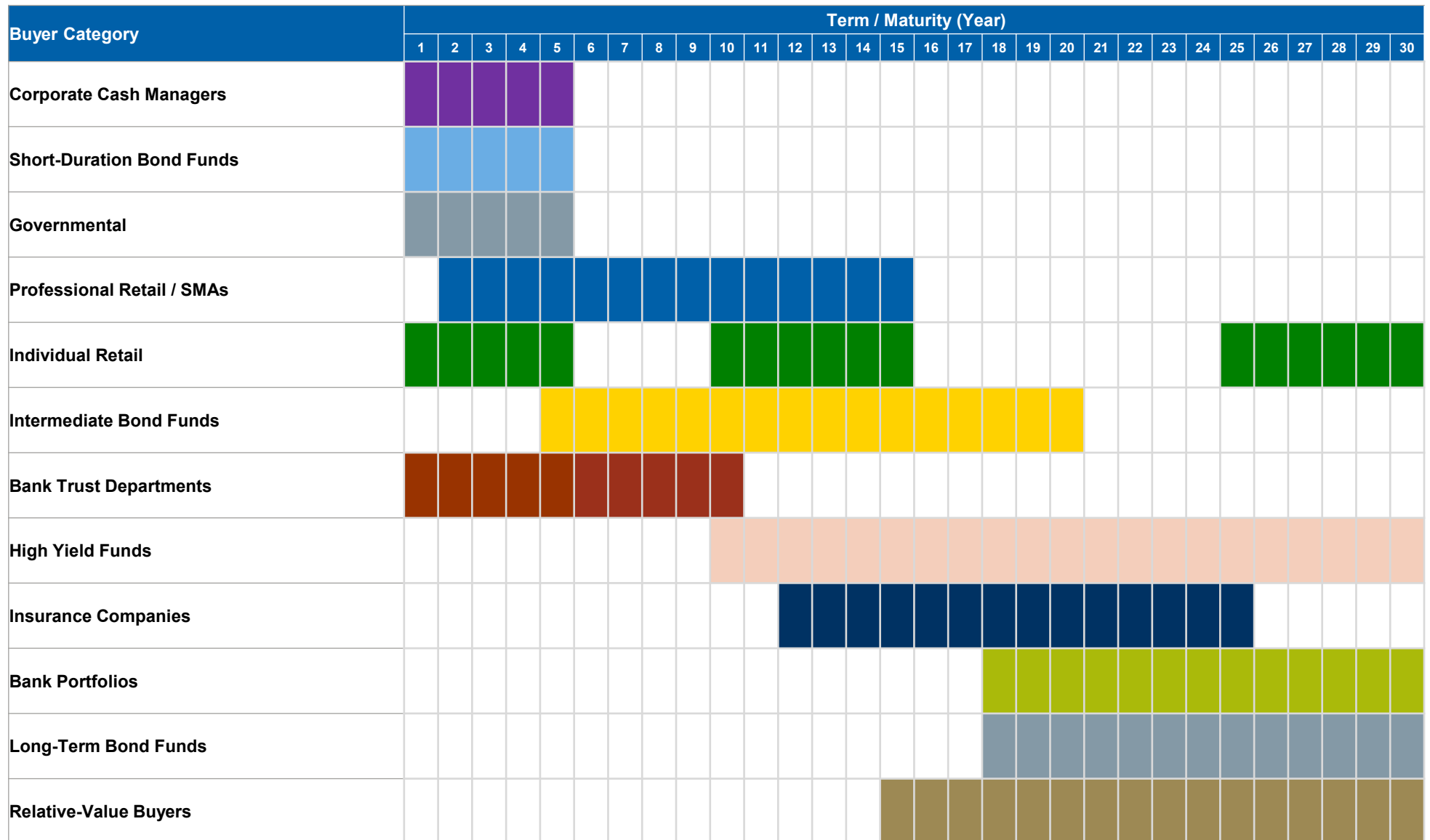
## Reporting Insurance Funds

## Non-Reporting Arbitrage / Relative Value Accounts



Source: RBCCM

# Investor Maturity Buyer Preference



Source: RBCCM

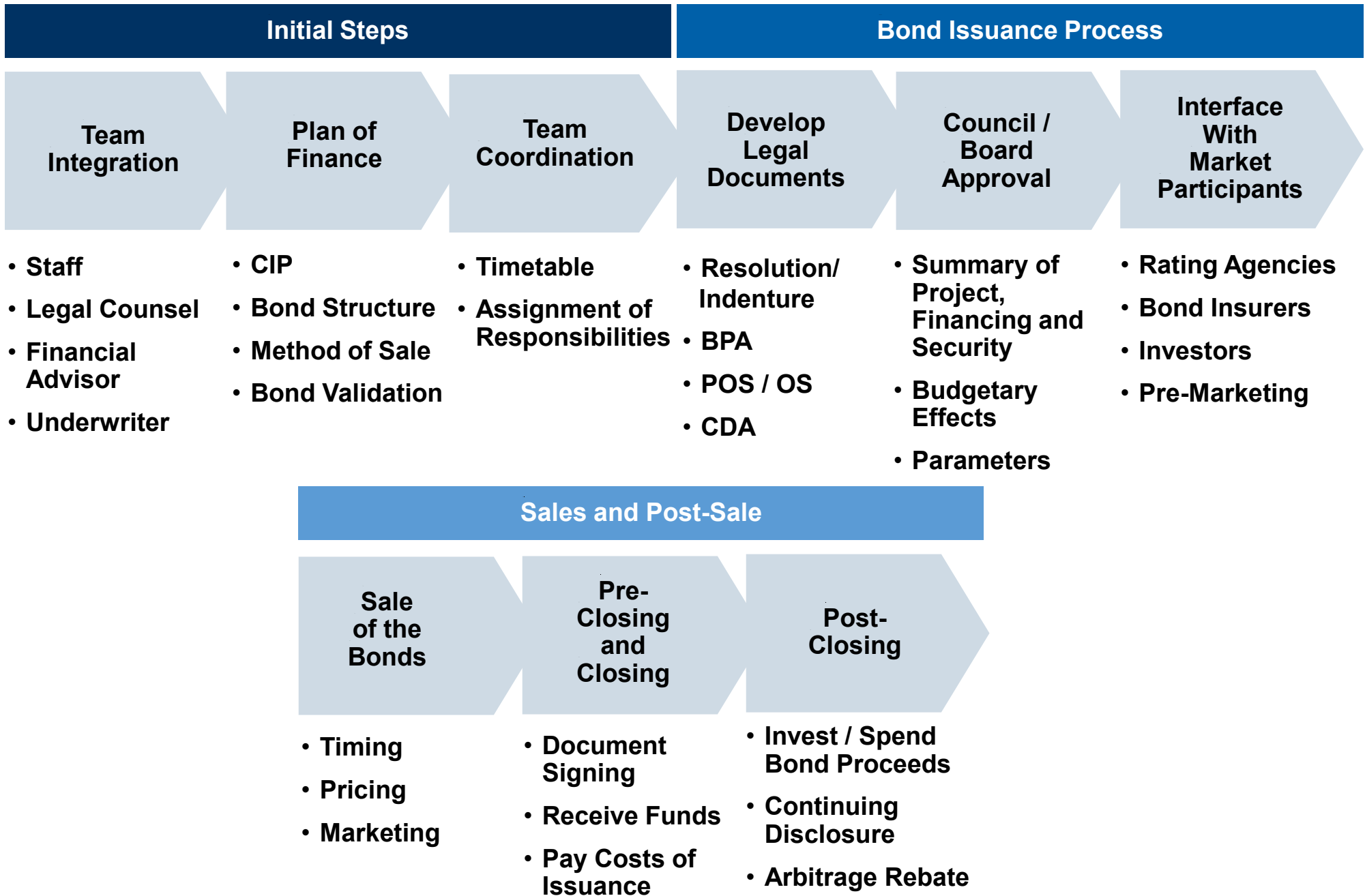
**SECTION III:**

**Common Bond Structuring Considerations**



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# Financing Process Overview



Source: RBCCM

## Financing Schedule – Example

A “typical” municipal bond issuance takes approximately 90 days from start to finish

January 2025							February 2025							March 2025						
S	M	T	W	R	F	S	S	M	T	W	R	F	S	S	M	T	W	R	F	S
			1	2	3	4							1							1
5	6	7	8	9	10	11	2	3	4	5	6	7	8	2	3	4	5	6	7	8
12	13	14	15	16	17	18	9	10	11	12	13	14	15	9	10	11	12	13	14	15
19	20	21	22	23	24	25	16	17	18	19	20	21	22	16	17	18	19	20	21	22
26	27	28	29	30	31		23	24	25	26	27	28		23	24	25	26	27	28	29
														30	31					

Date	Activity	Parties
01/02	Working Group Kickoff Call	ALL
01/13	Distribute First Draft of Bond Resolution	BC
01/17	Initial Comments Due on Bond Resolution	ALL
01/21	Distribute First Draft of POS	DC
01/24	Initial Comments Due on POS	ALL
02/07	Distribute Updated Financing Documents	BC, DC
02/10	Distribute Financing Documents to Rating Agencies	FA
02/18	Meetings with Rating Agencies	City, FA, UW
02/21	Agenda Deadline for Adoption of Bond Resolution	City, BC, DC
02/25	Receive Credit Ratings	City, FA
02/27	City Commission Meeting to Adopt Bond Resolution	City, BC
03/03	Due Diligence Call	ALL
03/04	Print POS	DC
03/12	Price Bonds	City, FA, UW
03/26	Pre-Closing	ALL
03/28	Closing	ALL

## Credit Ratings

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- Three primary credit rating agencies: Moody's, S&P, Fitch
- Credit ratings are applied for and paid by the issuer but are for the benefit of the investor
- Near final documents distributed including resolution/indenture, POS, audited financials, YTD budgetary performance, and preliminary financing numbers
- After reviewing documents, rating agencies will provide preliminary questions or request additional information
- Follow-up document distribution with a conference call, in-person presentation, or arrange a site visit
- After presentation is completed, rating analyst will present the credit to their "Credit Committee" to determine final credit rating
- Credit rating is then assigned followed by the distribution of a draft rating report for final review and then finally a press release with rating report

Credit Ratings (cont.)

- Size and location as well as demographic statistics of local government and/or service area
- Financial position including fund balance, liquidity, debt service coverage (DSC), revenue raising flexibility, size and composition of debt portfolio, anticipated borrowing needs (CIP)
- Strength and stability of pledged revenues (security pledge)
- Covenants such as DSC requirements, additional bonds test (ABT), debt service reserve fund (DSRF), etc.
- Quality and strength of management including budgetary practices, policies in place (fund balance, debt, investment, etc.), capital planning, management stability

Moody's	S&P	Fitch
Aaa	AAA	AAA
Aa1	AA+	AA+
Aa2	AA	AA
Aa3	AA-	AA-
A1	A+	A+
A2	A	A
A3	A-	A-
Baa1	BBB+	BBB+
Baa2	BBB	BBB
Baa3	BBB-	BBB-

Source: RBCCM



## Credit Ratings (cont.)

Rating agency scorecards can be used to predict credit ratings prior to approaching rating agencies

### Moody's US Municipal Utility Debt

		Rating Value	Aaa 0.5 to 1.5	Aa 1.5 to 2.5	A 2.5 to 3.5	Baa 3.5 to 4.5	Ba 4.5 to 5.5	SG 5.5 to 6.5
<b>City of Happyville, Florida</b>								
<b>System Characteristics</b>		<b>30%</b>						
Asset Condition (Remaining Useful Life)	75 ≥ n > 25 years	10%		✓				
Service Area Wealth (Median Family Income)	75.1%	12.5%			✓			
System Size (O&M)	\$16 million	7.5%			✓			
<b>Subtotal</b>		<b>0.80</b>	<b>0.00</b>	<b>0.20</b>	<b>0.60</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Financial Strength</b>		<b>40%</b>						
Annual Debt Service Coverage	1.63x	15%			✓			
Days Cash on Hand	1,062 days	15%	✓					
Debt to Operating Revenue	4.54x	10%			✓			
<b>Subtotal</b>		<b>0.90</b>	<b>0.15</b>	<b>0.00</b>	<b>0.75</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Management</b>		<b>20%</b>						
Rate Management		10%		✓				
Regulatory Compliance and Capital Planning		10%			✓			
<b>Subtotal</b>		<b>0.50</b>	<b>0.00</b>	<b>0.20</b>	<b>0.30</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Legal Provisions</b>		<b>10%</b>						
Rate Covenant	1.20x	5%			✓			
Debt Service Requirement	No DSRF	5%				✓		
<b>Subtotal</b>		<b>0.35</b>	<b>0.00</b>	<b>0.00</b>	<b>0.15</b>	<b>0.20</b>	<b>0.00</b>	<b>0.00</b>
<b>Total</b>		<b>2.55</b>	<b>0.15</b>	<b>0.40</b>	<b>1.80</b>	<b>0.20</b>	<b>0.00</b>	<b>0.00</b>

### Notch Factors

<b>Grid-Indicated Rating Accounting for Notch Factors</b>	<b>A1</b>
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### Composite Rating

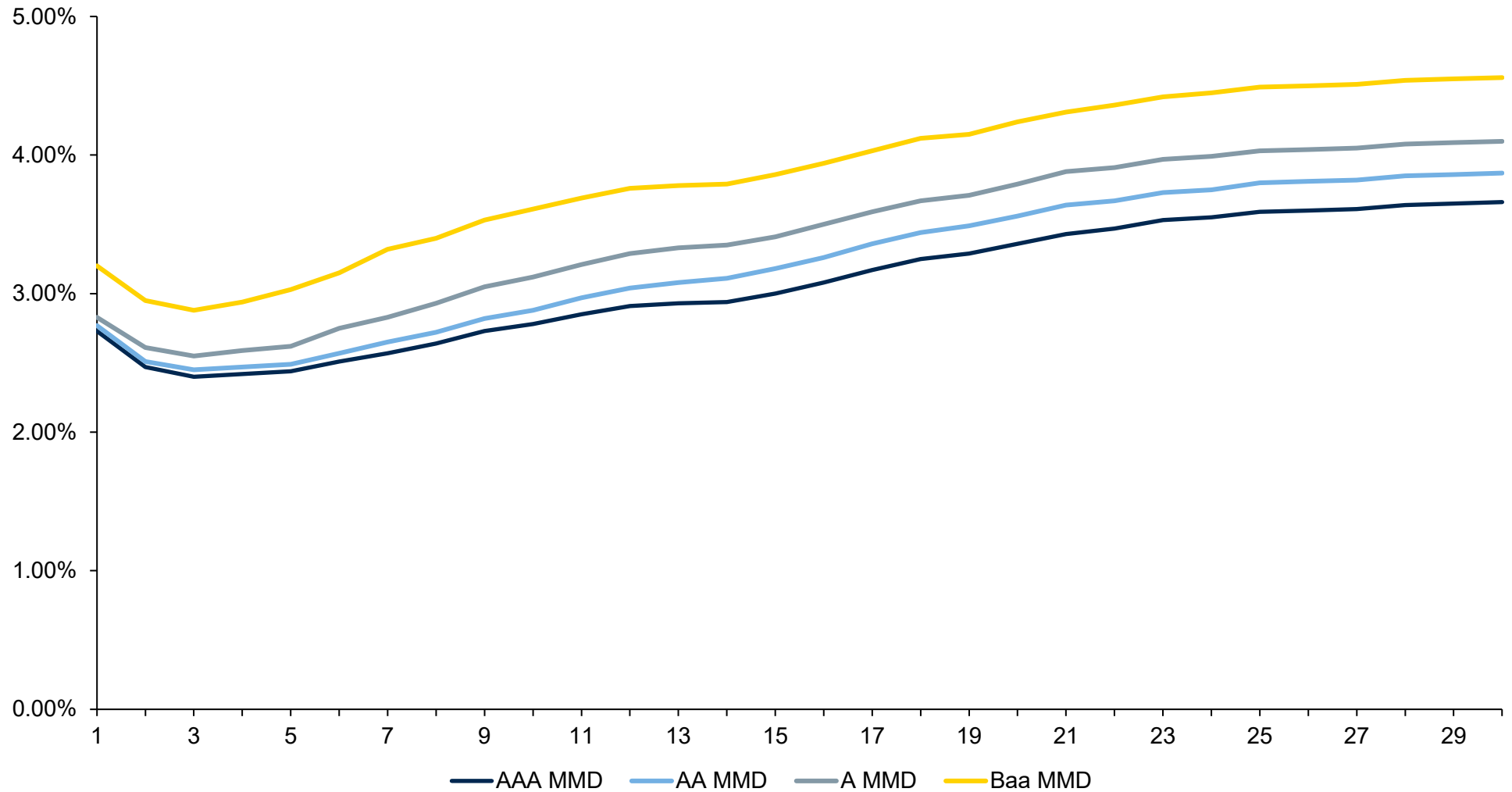
Aaa	0.50 to 1.50
Aa1	1.50 to 1.83
Aa2	1.83 to 2.17
Aa3	2.17 to 2.50
<b>A1</b>	<b>2.50 to 2.83</b>
A2	2.83 to 3.17
A3	3.17 to 3.50
Baa1	3.50 to 3.83
Baa2	3.83 to 4.17
Baa3	4.17 to 4.50

Source: RBCCM

## Credit Ratings (cont.)

While the higher the credit rating the lower the interest rate on the bonds, there's a “happy medium” between rating and cost

### Municipal GO MMD Index Yield Curves



Source: Refinitiv, as of 10/18/24

## Tax-Exempt vs. Taxable - Example

If project and security meet tax-exempt requirements, debt service savings will be realized

Tax-Exempt				Taxable			
Maturity (10/1)	Principal	Interest	Debt Service	Maturity (10/1)	Principal	Interest	Debt Service
2025	665,000	2,207,250	2,872,250	2025	790,000	2,501,869	3,291,869
2026	700,000	2,174,000	2,874,000	2026	820,000	2,469,321	3,289,321
2027	735,000	2,139,000	2,874,000	2027	855,000	2,435,127	3,290,127
2028	770,000	2,102,250	2,872,250	2028	890,000	2,399,473	3,289,473
2029	810,000	2,063,750	2,873,750	2029	930,000	2,361,292	3,291,292
2030	850,000	2,023,250	2,873,250	2030	970,000	2,320,465	3,290,465
2031	890,000	1,980,750	2,870,750	2031	1,015,000	2,276,815	3,291,815
2032	935,000	1,936,250	2,871,250	2032	1,060,000	2,230,633	3,290,633
2033	980,000	1,889,500	2,869,500	2033	1,110,000	2,180,919	3,290,919
2034	1,030,000	1,840,500	2,870,500	2034	1,160,000	2,128,305	3,288,305
2035	1,080,000	1,789,000	2,869,000	2035	1,215,000	2,072,741	3,287,741
2036	1,135,000	1,735,000	2,870,000	2036	1,275,000	2,013,935	3,288,935
2037	1,195,000	1,678,250	2,873,250	2037	1,340,000	1,951,587	3,291,587
2038	1,255,000	1,618,500	2,873,500	2038	1,405,000	1,885,391	3,290,391
2039	1,315,000	1,555,750	2,870,750	2039	1,475,000	1,815,282	3,290,282
2040	1,380,000	1,490,000	2,870,000	2040	1,545,000	1,742,417	3,287,417
2041	1,450,000	1,421,000	2,871,000	2041	1,625,000	1,664,240	3,289,240
2042	1,520,000	1,348,500	2,868,500	2042	1,705,000	1,582,015	3,287,015
2043	1,600,000	1,272,500	2,872,500	2043	1,795,000	1,495,742	3,290,742
2044	1,680,000	1,192,500	2,872,500	2044	1,885,000	1,404,915	3,289,915
2045	1,765,000	1,108,500	2,873,500	2045	1,980,000	1,309,534	3,289,534
2046	1,850,000	1,020,250	2,870,250	2046	2,080,000	1,206,376	3,286,376
2047	1,945,000	927,750	2,872,750	2047	2,190,000	1,098,008	3,288,008
2048	2,040,000	830,500	2,870,500	2048	2,305,000	983,909	3,288,909
2049	2,140,000	728,500	2,868,500	2049	2,425,000	863,818	3,288,818
2050	2,250,000	621,500	2,871,500	2050	2,550,000	737,476	3,287,476
2051	2,360,000	509,000	2,869,000	2051	2,685,000	604,621	3,289,621
2052	2,480,000	391,000	2,871,000	2052	2,825,000	464,732	3,289,732
2053	2,605,000	267,000	2,872,000	2053	2,970,000	317,550	3,287,550
2054	2,735,000	136,750	2,871,750	2054	3,125,000	162,813	3,287,813
<b>Total</b>	<b>\$44,145,000</b>	<b>\$41,998,250</b>	<b>\$86,143,250</b>	<b>Total</b>	<b>\$50,000,000</b>	<b>\$48,681,310</b>	<b>\$98,681,310</b>

Source: RBCCM

## Debt Structure - Example

Final maturity of the bonds can be structured to match the useful life of the assets being financed

### 20-Year Term

Maturity (10/1)	Principal	Interest	Debt Service
2025	1,310,000	2,170,000	3,480,000
2026	1,380,000	2,104,500	3,484,500
2027	1,445,000	2,035,500	3,480,500
2028	1,520,000	1,963,250	3,483,250
2029	1,595,000	1,887,250	3,482,250
2030	1,675,000	1,807,500	3,482,500
2031	1,760,000	1,723,750	3,483,750
2032	1,845,000	1,635,750	3,480,750
2033	1,940,000	1,543,500	3,483,500
2034	2,035,000	1,446,500	3,481,500
2035	2,140,000	1,344,750	3,484,750
2036	2,245,000	1,237,750	3,482,750
2037	2,355,000	1,125,500	3,480,500
2038	2,475,000	1,007,750	3,482,750
2039	2,600,000	884,000	3,484,000
2040	2,730,000	754,000	3,484,000
2041	2,865,000	617,500	3,482,500
2042	3,010,000	474,250	3,484,250
2043	3,160,000	323,750	3,483,750
2044	3,315,000	165,750	3,480,750
<b>Total</b>	<b>\$43,400,000</b>	<b>\$26,252,500</b>	<b>\$69,652,500</b>

### 25-Year Term

Maturity (10/1)	Principal	Interest	Debt Service
2025	915,000	2,189,750	3,104,750
2026	965,000	2,144,000	3,109,000
2027	1,010,000	2,095,750	3,105,750
2028	1,060,000	2,045,250	3,105,250
2029	1,115,000	1,992,250	3,107,250
2030	1,170,000	1,936,500	3,106,500
2031	1,230,000	1,878,000	3,108,000
2032	1,290,000	1,816,500	3,106,500
2033	1,355,000	1,752,000	3,107,000
2034	1,425,000	1,684,250	3,109,250
2035	1,495,000	1,613,000	3,108,000
2036	1,570,000	1,538,250	3,108,250
2037	1,650,000	1,459,750	3,109,750
2038	1,730,000	1,377,250	3,107,250
2039	1,815,000	1,290,750	3,105,750
2040	1,905,000	1,200,000	3,105,000
2041	2,005,000	1,104,750	3,109,750
2042	2,105,000	1,004,500	3,109,500
2043	2,210,000	899,250	3,109,250
2044	2,320,000	788,750	3,108,750
2045	2,435,000	672,750	3,107,750
2046	2,555,000	551,000	3,106,000
2047	2,685,000	423,250	3,108,250
2048	2,820,000	289,000	3,109,000
2049	2,960,000	148,000	3,108,000
<b>Total</b>	<b>\$43,795,000</b>	<b>\$33,894,500</b>	<b>\$77,689,500</b>

### 30-Year Term

Maturity (10/1)	Principal	Interest	Debt Service
2025	665,000	2,207,250	2,872,250
2026	700,000	2,174,000	2,874,000
2027	735,000	2,139,000	2,874,000
2028	770,000	2,102,250	2,872,250
2029	810,000	2,063,750	2,873,750
2030	850,000	2,023,250	2,873,250
2031	890,000	1,980,750	2,870,750
2032	935,000	1,936,250	2,871,250
2033	980,000	1,889,500	2,869,500
2034	1,030,000	1,840,500	2,870,500
2035	1,080,000	1,789,000	2,869,000
2036	1,135,000	1,735,000	2,870,000
2037	1,195,000	1,678,250	2,873,250
2038	1,255,000	1,618,500	2,873,500
2039	1,315,000	1,555,750	2,870,750
2040	1,380,000	1,490,000	2,870,000
2041	1,450,000	1,421,000	2,871,000
2042	1,520,000	1,348,500	2,868,500
2043	1,600,000	1,272,500	2,872,500
2044	1,680,000	1,192,500	2,872,500
2045	1,765,000	1,108,500	2,873,500
2046	1,850,000	1,020,250	2,870,250
2047	1,945,000	927,750	2,872,750
2048	2,040,000	830,500	2,870,500
2049	2,140,000	728,500	2,868,500
2050	2,250,000	621,500	2,871,500
2051	2,360,000	509,000	2,869,000
2052	2,480,000	391,000	2,871,000
2053	2,605,000	267,000	2,872,000
2054	2,735,000	136,750	2,871,750
<b>Total</b>	<b>\$44,145,000</b>	<b>\$41,998,250</b>	<b>\$86,143,250</b>

## Debt Structure - Example (cont.)

Final structure should take into account existing debt and potential future debt

### 30-Year Level

Maturity (10/1)	Outstanding Parity D/S	Series 2024 Principal	Series 2024 Interest	Total Series 2024 Debt Service	Aggregate Debt Service
2025	2,525,000	665,000	2,207,250	2,872,250	5,397,250
2026	2,525,000	700,000	2,174,000	2,874,000	5,399,000
2027	2,525,000	735,000	2,139,000	2,874,000	5,399,000
2028	2,525,000	770,000	2,102,250	2,872,250	5,397,250
2029	2,525,000	810,000	2,063,750	2,873,750	5,398,750
2030	2,525,000	850,000	2,023,250	2,873,250	5,398,250
2031	2,525,000	890,000	1,980,750	2,870,750	5,395,750
2032	2,525,000	935,000	1,936,250	2,871,250	5,396,250
2033	2,525,000	980,000	1,889,500	2,869,500	5,394,500
2034	2,525,000	1,030,000	1,840,500	2,870,500	5,395,500
2035	1,750,000	1,080,000	1,789,000	2,869,000	4,619,000
2036	1,750,000	1,135,000	1,735,000	2,870,000	4,620,000
2037	1,750,000	1,195,000	1,678,250	2,873,250	4,623,250
2038	1,750,000	1,255,000	1,618,500	2,873,500	4,623,500
2039	1,750,000	1,315,000	1,555,750	2,870,750	4,620,750
2040	-	1,380,000	1,490,000	2,870,000	2,870,000
2041	-	1,450,000	1,421,000	2,871,000	2,871,000
2042	-	1,520,000	1,348,500	2,868,500	2,868,500
2043	-	1,600,000	1,272,500	2,872,500	2,872,500
2044	-	1,680,000	1,192,500	2,872,500	2,872,500
2045	-	1,765,000	1,108,500	2,873,500	2,873,500
2046	-	1,850,000	1,020,250	2,870,250	2,870,250
2047	-	1,945,000	927,750	2,872,750	2,872,750
2048	-	2,040,000	830,500	2,870,500	2,870,500
2049	-	2,140,000	728,500	2,868,500	2,868,500
2050	-	2,250,000	621,500	2,871,500	2,871,500
2051	-	2,360,000	509,000	2,869,000	2,869,000
2052	-	2,480,000	391,000	2,871,000	2,871,000
2053	-	2,605,000	267,000	2,872,000	2,872,000
2054	-	2,735,000	136,750	2,871,750	2,871,750
<b>Total</b>	<b>\$34,000,000</b>	<b>\$44,145,000</b>	<b>\$41,998,250</b>	<b>\$86,143,250</b>	<b>\$120,143,250</b>

### 30-Year Wrapped

Maturity (10/1)	Outstanding Parity D/S	Series 2024 Principal	Series 2024 Interest	Total Series 2024 Debt Service	Aggregate Debt Service
2025	2,525,000	-	2,227,750	2,227,750	4,752,750
2026	2,525,000	-	2,227,750	2,227,750	4,752,750
2027	2,525,000	-	2,227,750	2,227,750	4,752,750
2028	2,525,000	-	2,227,750	2,227,750	4,752,750
2029	2,525,000	-	2,227,750	2,227,750	4,752,750
2030	2,525,000	-	2,227,750	2,227,750	4,752,750
2031	2,525,000	-	2,227,750	2,227,750	4,752,750
2032	2,525,000	-	2,227,750	2,227,750	4,752,750
2033	2,525,000	-	2,227,750	2,227,750	4,752,750
2034	2,525,000	-	2,227,750	2,227,750	4,752,750
2035	1,750,000	205,000	2,227,750	2,432,750	4,182,750
2036	1,750,000	215,000	2,217,500	2,432,500	4,182,500
2037	1,750,000	225,000	2,206,750	2,431,750	4,181,750
2038	1,750,000	240,000	2,195,500	2,435,500	4,185,500
2039	1,750,000	250,000	2,183,500	2,433,500	4,183,500
2040	-	2,010,000	2,171,000	4,181,000	4,181,000
2041	-	2,115,000	2,070,500	4,185,500	4,185,500
2042	-	2,220,000	1,964,750	4,184,750	4,184,750
2043	-	2,330,000	1,853,750	4,183,750	4,183,750
2044	-	2,445,000	1,737,250	4,182,250	4,182,250
2045	-	2,570,000	1,615,000	4,185,000	4,185,000
2046	-	2,695,000	1,486,500	4,181,500	4,181,500
2047	-	2,830,000	1,351,750	4,181,750	4,181,750
2048	-	2,975,000	1,210,250	4,185,250	4,185,250
2049	-	3,120,000	1,061,500	4,181,500	4,181,500
2050	-	3,275,000	905,500	4,180,500	4,180,500
2051	-	3,440,000	741,750	4,181,750	4,181,750
2052	-	3,615,000	569,750	4,184,750	4,184,750
2053	-	3,795,000	389,000	4,184,000	4,184,000
2054	-	3,985,000	199,250	4,184,250	4,184,250
<b>Total</b>	<b>\$34,000,000</b>	<b>\$44,555,000</b>	<b>\$52,636,000</b>	<b>\$97,191,000</b>	<b>\$131,191,000</b>

Source: RBCCM

**SECTION IV:**

**Identifying Refunding Opportunities**



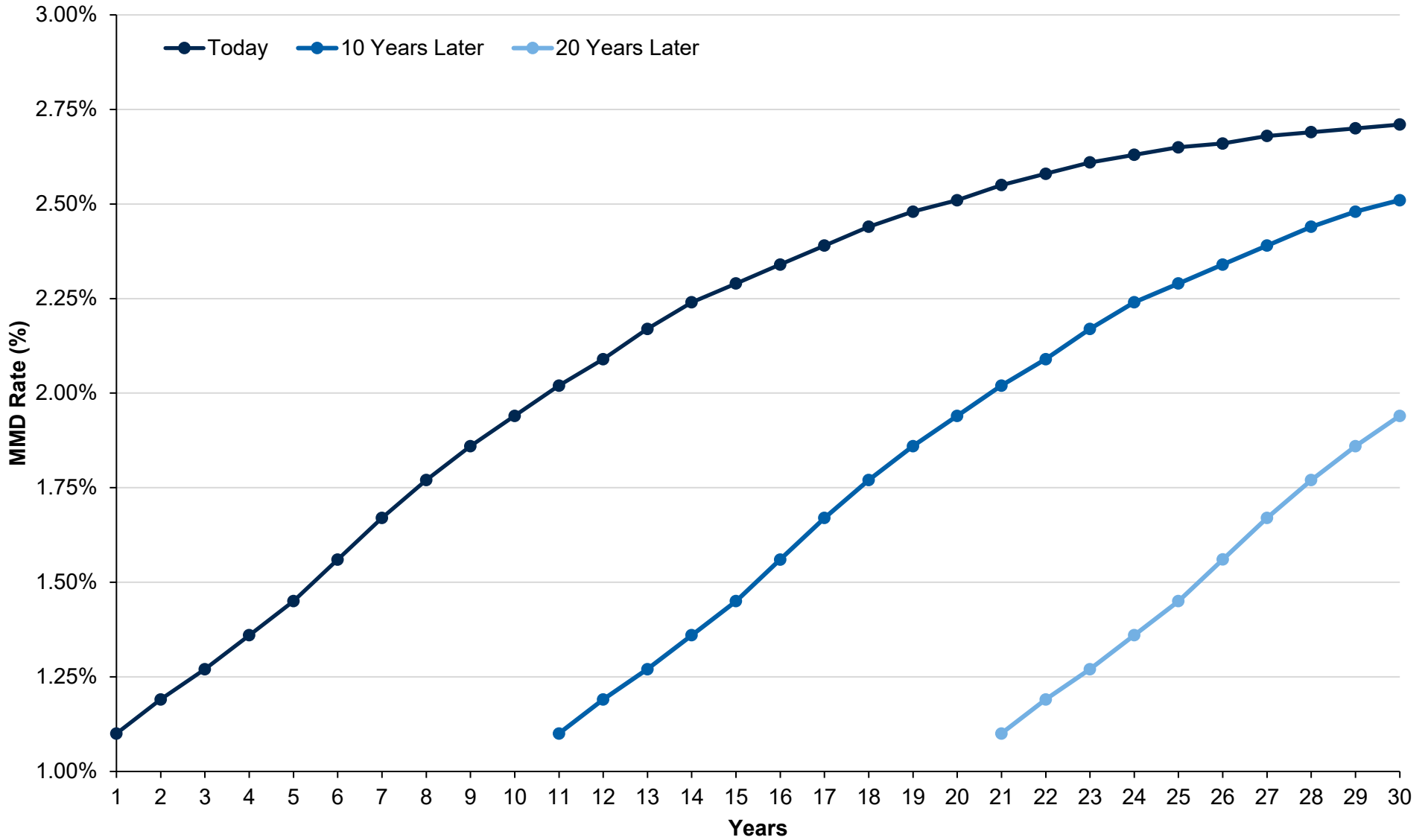
**Capital  
Markets**

## Factors Impacting Refunding Opportunities

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- Optional redemption (option) and call price
- Coupon rates (bonds) or interest rate (bank loan)
- Principal / par amount outstanding
- Final maturity
- Tax status
- Current market yields
- Credit rating changes
- Unspent bond or bank loan proceeds
- Guaranteed investment contracts or other derivative products requiring breakage
- Debt service reserve funding required

## Riding the MMD Yield Curve





# Examination of Evaluating Debt Portfolio

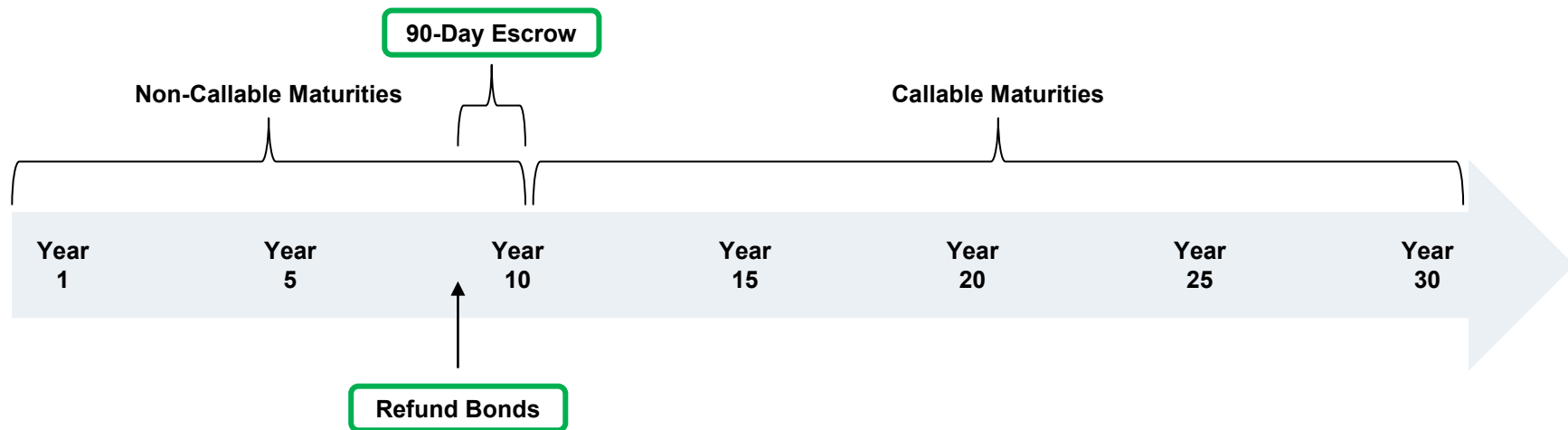
Series	Principal Outstanding	Debt Type	Tax Status	Coupon (Outstanding)	Maturity Range (Outstanding)	Call Date	Final Maturity	Use of Proceeds
<b>Utility System</b>								
Series	Principal Outstanding	Debt Type	Tax Status	Coupon (Outstanding)	Maturity Range (Outstanding)	Call Date	Final Maturity	Use of Proceeds
2016	43,010,000	Fixed	Tax-Exempt	3.00-5.00%	2021-2030	10/01/2025	10/01/2030	Advance Refunding
2022	262,750,000	Fixed	Tax-Exempt	4.00%-5.25%	2023-2042	10/01/2032	10/01/2052	New Money
2023	50,000,000	Fixed	Taxable	4.11%	2024-2026	Non-Callable	10/01/2026	Taxable Refunding
	<b>\$355,760,000</b>							
<b>Transportation</b>								
Series	Principal Outstanding	Debt Type	Tax Status	Coupon (Outstanding)	Maturity Range (Outstanding)	Call Date	Final Maturity	Use of Proceeds
2014	75,000,000	Fixed	Tax-Exempt	2.25% -4.75%	2021-2022	10/01/2024	10/01/2034	New Money
2015	180,075,000	Fixed	Tax-Exempt	2.00-5.00%	2021-2030	10/01/2025	10/01/2037	Advance Refunding
2018	8,190,000	Fixed	Tax-Exempt	5.00%	2021-2025	Non-Callable	10/01/2025	Refunding/Term. Swap
2020	120,945,000	Fixed	Taxable	0.550-2.050%	2021-2031	Non-Callable	10/01/2031	Advance Refunding
	<b>\$384,210,000</b>							
<b>General Fund</b>								
Series	Principal Outstanding	Debt Type	Tax Status	Coupon (Outstanding)	Maturity Range (Outstanding)	Call Date	Final Maturity	Use of Proceeds
2013B	3,745,000	Fixed	Taxable	2.777-4.640%	2024-2026	Anytime MWC	10/01/2026	Advance Refunding
2014	77,310,000	Fixed	Tax-Exempt	5.000%	2024-2034	10/01/2024	10/01/2034	Advance Refunding
2016A	60,845,000	Fixed	Tax-Exempt	3.000-5.000%	2024-2040	10/01/2026	10/01/2040	Advance Refunding
2016B	43,430,000	Fixed	Tax-Exempt	2.250-5.000%	2024-2030	10/01/2026	10/01/2030	Advance Refunding
2017A	93,395,000	Fixed	Tax-Exempt	3.000-5.250%	2024-2047	10/01/2027	10/01/2047	Advance Refunding
2018	36,485,000	Fixed	Tax-Exempt	5.000%	2024-2038	10/01/2028	10/01/2038	New Money
2019A	121,500,000	Fixed	Tax-Exempt	5.000%	2024-2039	10/01/2029	10/01/2039	New Money/Refunding
2019B	45,535,000	Fixed	Tax-Exempt	5.000%	2026-2030	10/01/2026	10/01/2030	Current Refunding
2020A	95,350,000	Fixed	Tax-Exempt	4.000-5.000%	2024-2050	10/01/2030	10/01/2050	New Money/Refunding
2020B	8,485,000	Fixed	Tax-Exempt	5.000%	2024-2027	Non-Callable	10/01/2027	New Money/Refunding
2020C	90,620,000	Fixed	Taxable	0.393-2.766%	2024-2041	10/01/2030	10/01/2041	New Money/Refunding
2021A	81,000,000	Fixed	Tax-Exempt	3.000-5.000%	2024-2041	10/01/2031	10/01/2041	New Money
2022A	114,865,000	Fixed	Tax-Exempt	5.000%	2024-2032	Non-Callable	10/01/2032	Refunding
2022B	27,848,800	Fixed	Taxable	2.770%	2024-2041	Anytime MWC	10/01/2041	New Money
2022C	97,685,000	Fixed	Tax-Exempt	5.000-5.250%	2024-2037	10/01/2032	10/01/2037	New Money
2023A	255,925,000	Fixed	Tax-Exempt	5.000-5.500%	2024-2053	10/01/2033	10/01/2053	New Money/Refunding
2023B	27,135,000	Fixed	Tax-Exempt	5.000%	2024-2026	Non-Callable	10/01/2026	Refunding
	<b>\$1,281,158,800</b>							
<b>Notes</b>								
Series	Principal Outstanding	Debt Type	Tax Status	Coupon (Outstanding)	Maturity Range (Outstanding)	Call Date	Final Maturity	Use of Proceeds
CP	\$26,600,000	Variable	Tax-Exempt	2.050%	2022	Anytime	-	Project Funding
	<b>\$26,600,000</b>							

Source: RBCCM

### Current Refunding

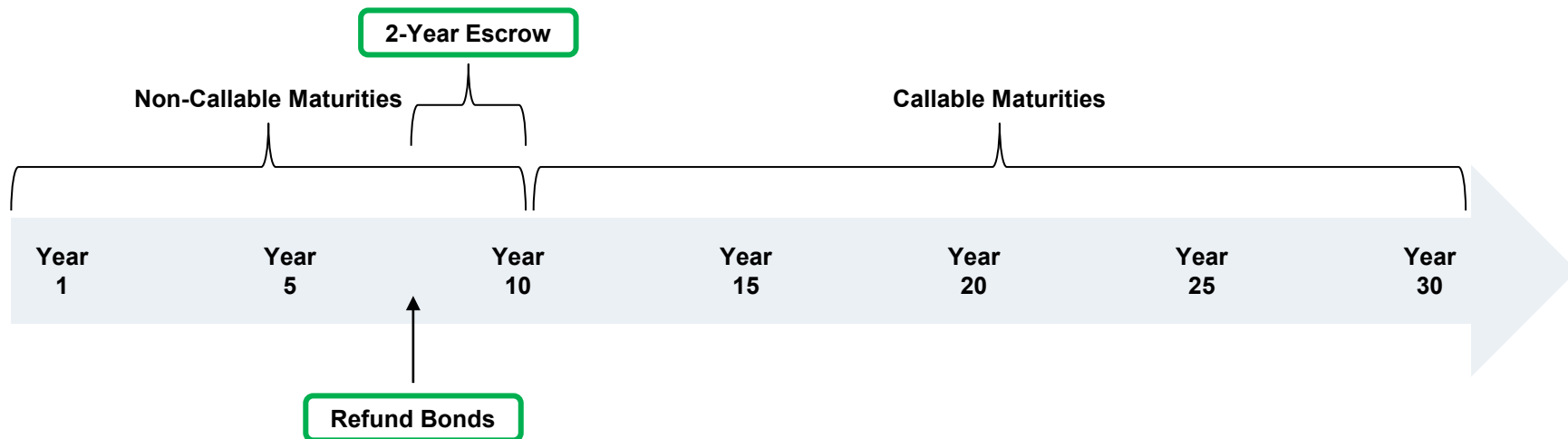
- Issue tax-exempt or taxable refunding debt within 90 days of call date
- Proceeds can be deposited to an escrow until the call date
- Short escrow efficiency depending on short-term investment rates
- Conditional call notice, if available, may help shorten the typical minimum 30-day escrow requirement
- Value of call option diminishes after call date

If a bond issue is callable on October 1, 2025, the earliest date available for a current refunding would be July 3, 2025 (90 days prior to the call date)



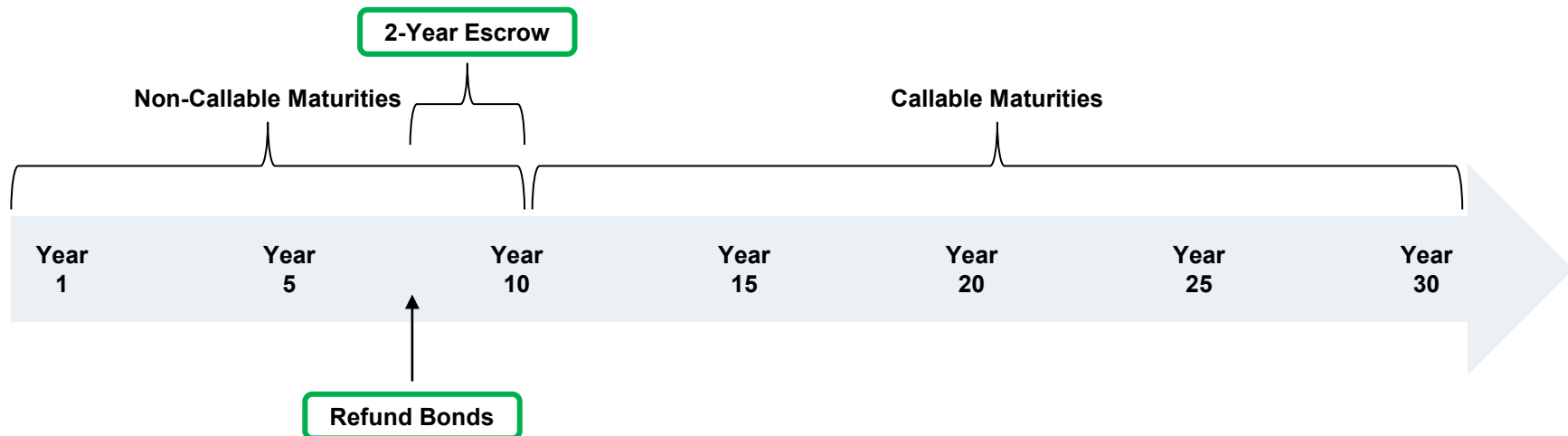
## Tax-Exempt Advance Refunding

- Issue tax-exempt refunding debt more than 90 days prior to the call date and deposit proceeds into an escrow that, along with investment earnings, will pay off all interest and principal payments through the call date and all remaining principal thereafter
- **Tax-exempt advance refundings were eliminated by the 2017 Tax Act (no more than one tax-advantaged bond or loan can be outstanding for the same issuance)**
- Continues to be attempts to bring tax-exempt advance refundings back, but nothing imminent on the horizon



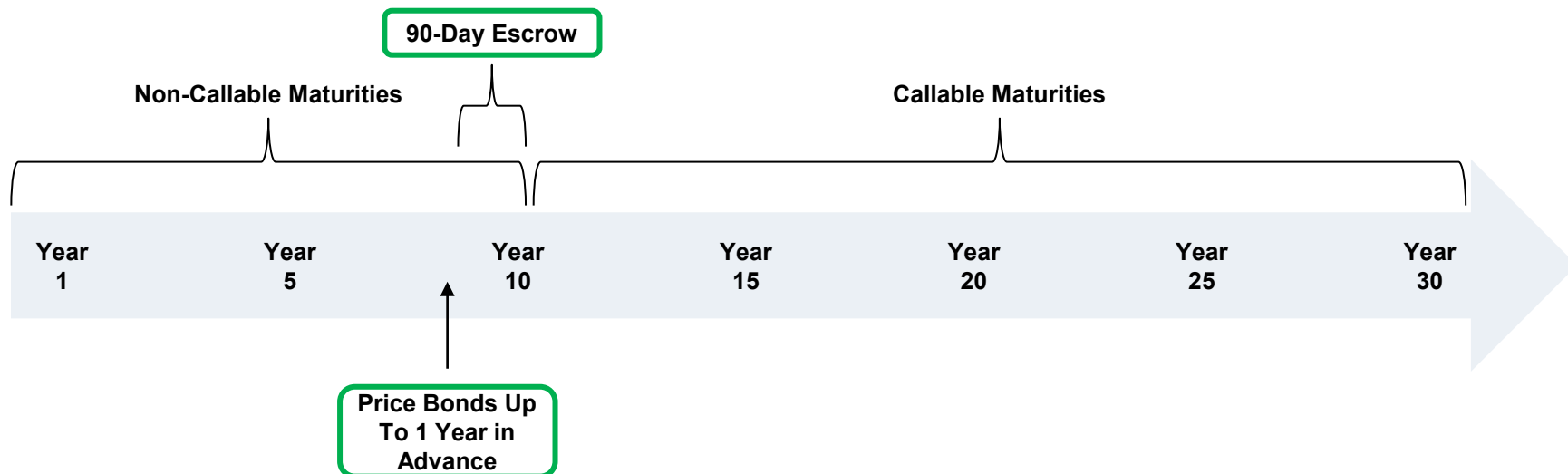
## Taxable Advance Refunding

- Issue taxable refunding debt more than 90 days from call date and deposit proceeds into an escrow that, along with investment earnings, would pay off all interest and principal payments through call date and all remaining principal thereafter
- Taxable advance refundings can be used on both outstanding tax-exempt and taxable debt
- Many taxable advance refundings were completed from 2018-2022 when taxable rates were near historical lows



## Tax-Exempt Forward Refunding

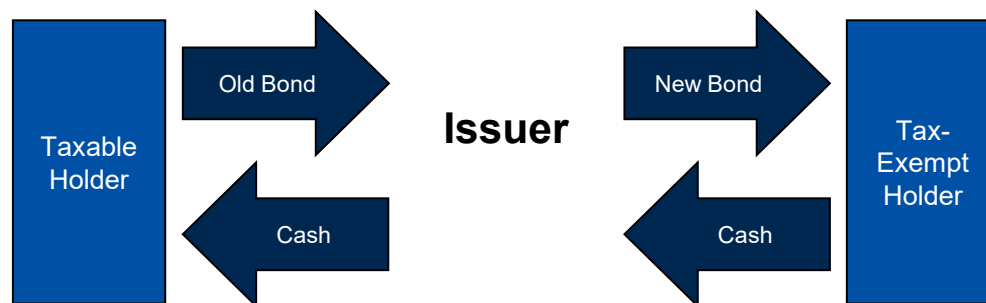
- Sell bonds today at current market rates with delivery and funding scheduled within 90 days of the call date so that bonds are considered current (not advance) refunding bonds
- Investors require a forward premium for locking-in rates today with delayed delivery of the bonds until closer to the call date
- Eliminates any negative arbitrage in the escrow
- Requires more in-depth documentation at initial pricing and upon delivery of the bonds
- Potential implications if issuer is not able to deliver/close on the bonds



### Tender Offer with Refinancing

- An offer to repurchase existing bonds for cash, funded with a new tax-exempt issue
- Participation is flexible since the holder can choose to participate in tender, but is not required to buy new issue, or vice versa
- Accounting treatment not a factor for outstanding taxable refunding bonds if issued at par
- New issue execution risk can be mitigated by making the tender contingent on the success of the tax-exempt refinancing issue

#### Tender Mechanics



## Types of Refundings (cont.)

### Cash Optimization Strategy

- Use cash intended or assigned for capital projects to defease debt that is not eligible for tax-exempt advance refunding and 15 days later issue tax exempt bonds to replace cash under the same structure

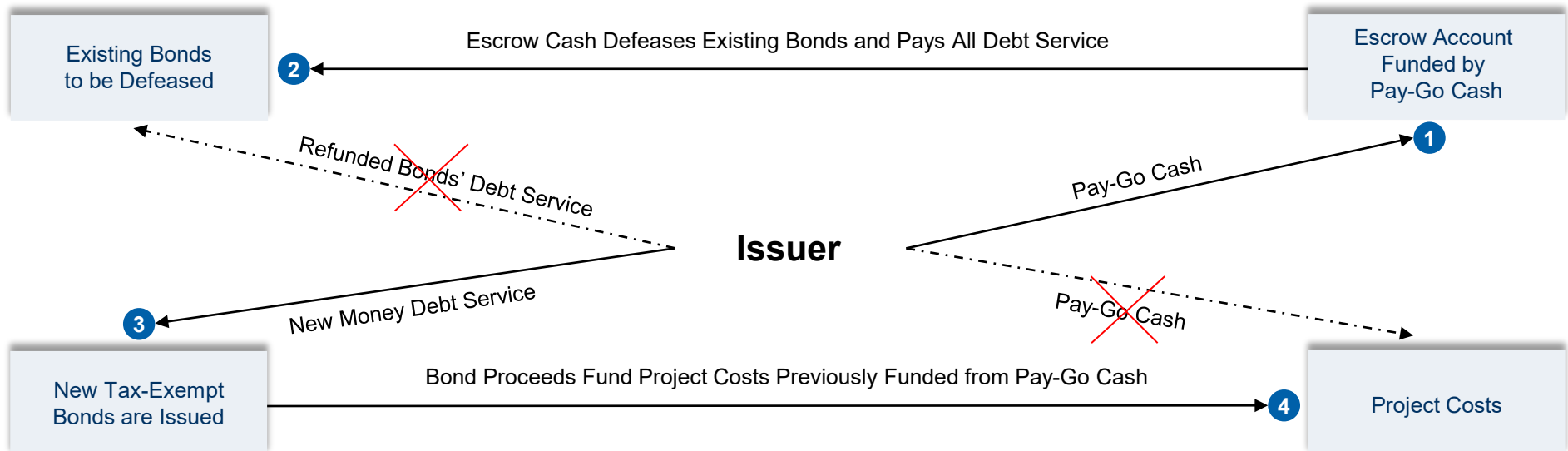
#### Mechanics

- The Issuer applies current fiscal year Pay-Go funds to establish an escrow for select Bonds
- The fully funded escrow cash defeases the Bonds and pays all related debt service of the refunded Bonds
- New tax-exempt Bonds are issued
- Bonds proceeds from new issuance funds project costs previously funded from Pay-Go cash

#### Benefits of Debt Optimization

- Debt optimization can generate strong debt service savings today comparable to an advance refunding
  - Reduces interest expense
  - Locks in savings eliminating market risk
  - Creates highly efficient escrow
- Reprogramming cash for its most efficient use lowers the cost of debt
- Structure requires sufficient cash balances and upcoming capital needs

#### Pay-Go Reprogramming Mechanics



Source: RBCCM

Why did the municipal  
bond change its career?

It just lost interest!