



*Current Market Update*

**PNC Capital Markets LLC**  
**Public Finance**

February 2021



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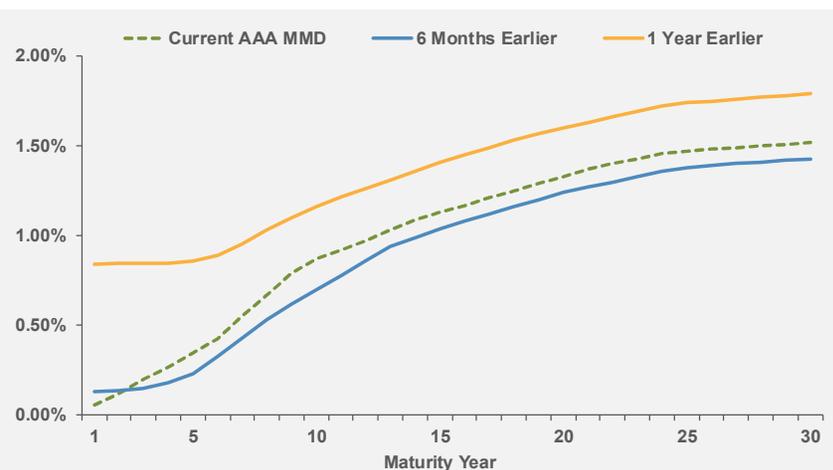
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Market Update

Section I

# Changes in the AAA MMD Yield Curve and Interest Rates

## AAA MMD Yield Curve



## 10 Yr. AAA MMD vs. 10 Yr. Treasury



## AAA MMD / U.S. Treasuries

Maturity	Current			1 Month Change			6 Month Change			12 Month Change		
	AAA MMD	US Treasury	Ratio	AAA MMD (bps)	US Treasury (bps)	Ratio	AAA MMD (bps)	US Treasury (bps)	Ratio	AAA MMD (bps)	US Treasury (bps)	Ratio
2 Year	0.12%	0.10%	120.00%	-3	-3	4.62%	-2	-4	20.00%	-73	-132	60.14%
3 Year	0.20%	0.21%	95.24%	+2	+1	5.24%	+5	+4	7.00%	-65	-118	34.09%
5 Year	0.35%	0.58%	60.34%	+8	+13	0.34%	+12	+30	(21.80%)	-51	-83	(0.65%)
7 Year	0.55%	0.97%	56.70%	+7	+20	(5.64%)	+12	+49	(32.88%)	-40	-52	(7.06%)
10 Year	0.87%	1.34%	64.93%	+8	+25	(7.55%)	+17	+66	(38.02%)	-29	-23	(8.96%)
30 Year	1.52%	2.13%	71.36%	+5	+30	(8.97%)	+9	+71	(29.34%)	-27	+12	(17.69%)

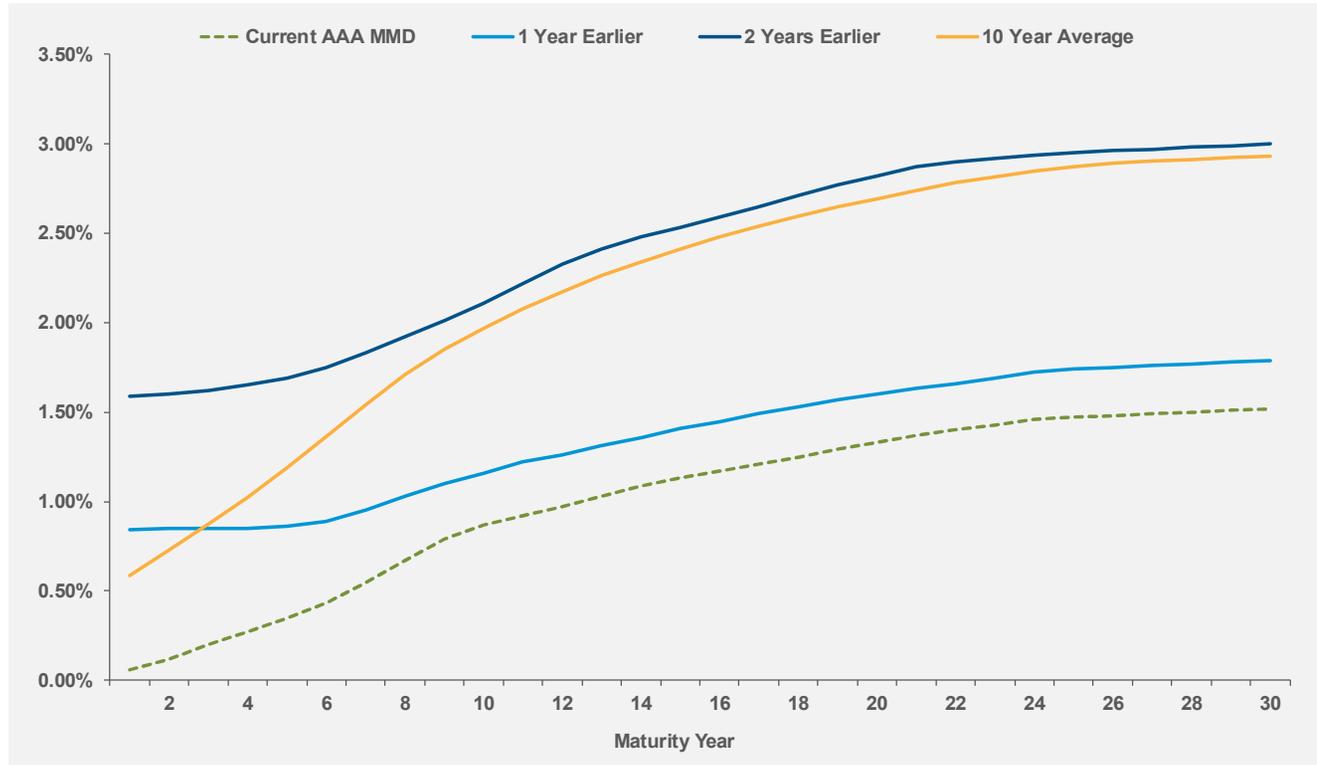
Rates as of February 19, 2021

Sources: Thomson Reuters Municipal Market Monitor / Bloomberg, as of February 19, 2021. Note: AAA MMD assumes an optional 10-year par call. Green indicates interest rates / ratios declined while red denotes interest rates / ratios increased.

# Tax-Exempt Interest Rate Movement – AAA MMD Yield Curve

- Thomson Reuters Municipal Market Data (MMD) produces the tax-exempt yield curve daily from trading and market activity to reflect the offer-side of the market.
- As determined by the MMD analyst team, the AAA MMD curve is derived from trading activity of the highest-grade AAA rated state general obligation bonds.
- The curve represents the yield to call (YTC) of 5.00% coupon bonds that have a 10 year optional redemption feature.
- The current AAA MMD curve remains below the 10 year average curve in the mid- to long-term.

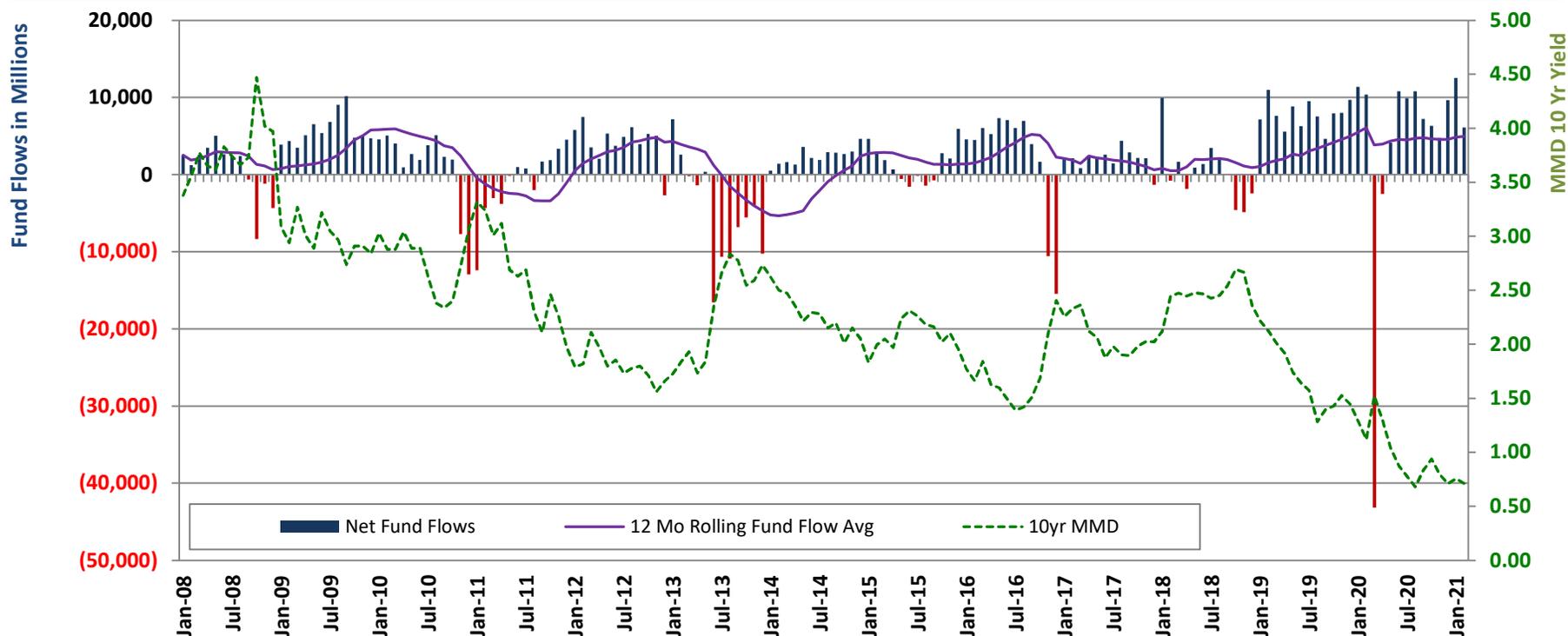
## AAA MMD Yield Curves



Maturity Year	Current AAA MMD	1 Year Earlier	2 Years Earlier	10 Year Average
2 Yr.	0.12%	0.85%	1.60%	0.73%
5 Yr.	0.35%	0.86%	1.69%	1.19%
10 Yr.	0.87%	1.16%	2.11%	1.97%
30 Yr.	1.52%	1.79%	3.00%	2.93%

Source: Thomson Reuters Municipal Market Monitor, as of February 19, 2021

## Investor Fixed-Income Demand – Municipal Bond Fund Flows



Net Fund Flows - 2020	
January 2020	\$11.4 Billion
February 2020	\$10.3 Billion
March 2020	(\$43.1) Billion
April 2020	(\$2.5) Billion
May 2020	\$2.5 Billion
June 2020	\$10.8 Billion
<b>Full Year 2019</b>	<b>\$93.6 Billion</b>

Net Fund Flows - 2020	
July 2020	\$9.9 Billion
August 2020	\$10.8 Billion
September 2020	\$7.2 Billion
October 2020	\$6.3 Billion
November 2020	\$4.7 Billion
December 2020	\$9.6 Billion
<b>Full Year 2020</b>	<b>\$39.6 Billion</b>

Net Fund Flows - 2021	
January 2021	\$12.5 Billion
February 2021	\$6.1 Billion (MTD)

Source: ICI Investment Research as of February 17, 2021

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## Refinancing Summary

## Section II

Note: All figures are based on market conditions as of February 2021 utilizing applicable credit ratings for each issue presented (AA- (s)). Rates, credit spreads, pricing structure demand, and interest rate proxies are subject to change until date of actual pricing. The interest rates used in the above analysis are hypothetical and reflect the midpoint in a range of market rates. There is no guarantee that these rates or level of resulting debt service savings can be achieved.

# Refunding Overview: 5-Year Refunding Horizon

## Current Refunding Eligible Issue Summary

Series	Call Date	90-Days Prior	Par @ Call Date	Final Maturity	Est. NPV Savings	as % of Par (based on Level Annual Savings scenario)	
1	2016	7/15/2021	4/16/2021	\$4,700,000	7/15/2030	\$195,983	4.17%
2	2017	9/1/2022	6/3/2022	7,185,000	9/1/2027	366,778	5.10%
3	2014 B	11/1/2024	8/3/2024	15,395,000	11/1/2033	1,552,560	10.08%
4	AWB 2016	10/15/2024	7/17/2024	738,093	10/15/2028	0	0.00%
5	2015 B	7/15/2025	4/16/2025	6,310,000	7/15/2034	628,403	9.96%
6	2019 A	3/1/2025	12/1/2024	4,620,000	9/1/2028	103,009	2.23%
7	2019 B	3/1/2025	12/1/2024	2,835,000	3/1/2038	89,576	3.16%
8	2020 A	7/15/2025	4/16/2025	7,690,000	7/15/2034	178,383	2.32%
Totals				\$49,473,093		\$3,114,693	6.30%

## Refunding Efficiency Results Based on Prevailing Market Conditions - Savings Funded at Bond Closing (year of settlement)

Series	FY	2021	2022	2023	2024	2025	2026
1	2016	183,139					
2	2017		417,922				
3	2014 B				1,712,032		
4	AWB 2016				0		
5	2015 B					666,043	
6	2019 A				103,820		
7	2019 B				55,548		
8	2020 A					171,787	
Totals			\$417,922	\$0	\$1,871,399	\$837,830	\$0

## Refunding Efficiency Results Based on Prevailing Market Conditions - Level Annual Savings (Annual D/S Reduction)

Series	FY	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
1	2016		(22,280)	(19,281)	(18,812)	(20,411)	(23,357)	(21,132)	(18,798)	(20,675)	(23,375)	(18,481)							
2	2017			(61,739)	(60,897)	(61,262)	(60,920)	(64,499)	(63,729)										
3	2014 B					(170,917)	(167,688)	(169,364)	(166,057)	(167,416)	(167,337)	(167,161)	(168,152)	(165,576)	(164,027)				
4	AWB 2016					0	0	0	0	0	0								
5	2015 B						(67,767)	(68,830)	(68,870)	(66,329)	(65,668)	(68,647)	(66,369)	(67,838)	(68,573)	(59,527)			
6	2019 A					(18,570)	(21,178)	(20,004)	(21,584)	(22,013)									
7	2019 B					(9,929)	(5,133)	(7,383)	(4,583)	(4,683)	(4,783)	(8,590)	(7,380)	(6,280)	(5,235)	(9,163)	(8,013)	(6,888)	(5,444)
8	2020 A						(20,933)	(19,506)	(17,592)	(18,868)	(18,686)	(18,503)	(18,321)	(18,139)	(17,957)	(22,605)			
Totals			(\$22,280)	(\$81,020)	(\$79,709)	(\$281,089)	(\$366,975)	(\$370,716)	(\$361,212)	(\$299,983)	(\$279,848)	(\$281,383)	(\$260,222)	(\$257,833)	(\$255,792)	(\$91,294)	(\$8,013)	(\$6,888)	(\$5,444)

## Refunding Efficiency Results Based on Prevailing Market Conditions - Shorten Term (Annual D/S Reduction)

Series	FY	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
1	2016		(3,444)	(820)	(914)	(2,981)	(1,663)	(4,545)	(2,586)	(199)	(3,368)	(203,043)							
2	2017			(2,473)	(2,770)	(759)	(1,994)	(2,671)	(373,838)										
3	2014 B					(2,843)	(3,063)	(844)	(1,953)	(2,361)	(1,421)	(476)	(787)	(2,106)	(1,842,977)				
4	AWB 2016					0	0	0	0	0									
5	2015 B						(3,714)	(1,584)	(3,674)	(2,843)	(3,549)	(3,384)	(2,564)	(980)	(3,264)	(713,163)			
6	2019 A					(350)	(3,296)	(2,664)	(226)	(94,984)									
7	2019 B					(4,904)	(133)	(2,533)	(4,883)	(4,983)	(5,083)	(3,890)	(2,780)	(1,780)	(835)	(4,863)	(3,813)	(2,788)	(56,444)
8	2020 A						(2,613)	(1,550)	(182)	(1,914)	(2,096)	(2,279)	(2,461)	(2,643)	(2,826)	(188,316)			
Totals			(\$3,444)	(\$3,293)	(\$3,683)	(\$11,837)	(\$16,476)	(\$16,389)	(\$387,342)	(\$107,283)	(\$15,517)	(\$213,072)	(\$8,592)	(\$7,509)	(\$1,849,902)	(\$906,342)	(\$3,813)	(\$2,788)	(\$56,444)

**Note:** Rates utilized for the analysis reflect prevailing market conditions as of February 2021, and a credit rating of "AA-", plus a small sensitivity spread. The interest rates utilized are hypothetical and reflect the midpoint in a range of market rates. Important to note that prevailing market tax-exempt rates are hovering at or near historical lows depending upon the maturity along the yield curve. There is no guarantee that these rates, level of resulting debt service or savings efficiency can be achieved at the time of refunding.

Series of 2016 refunding is the pending opportunity for calendar year 2021

NPV Savings reflects net local share where applicable; Est. NPV Savings includes residual bond rounding.

## Refunding Overview: Series of 2016, Level Annual

### Summary of Refunding Issuance

#### Refunded Issue Detail

Refunded Issue	Series of 2016
Use of Proceeds	Refunding (11)
Par Amount Outstanding	\$4,700,000
Call Date	07/15/21
90-Day Period	04/16/21
Final Maturity	07/15/30
Remaining Avg Rate	2.453%

#### Refunding Issue Detail

Est. Settlement Date	04/15/21
Par Amount Refunded	\$4,700,000
Est. Par New Amount	\$4,655,000
New Call Date	07/15/26
Final Maturity	07/15/30
Est. Bond Yield	1.240%

#### Refunding Results (Current Market)

Est. NPV Savings	\$195,983
as % of Refunded	4.170%
Est. Cash Flow Savings	\$206,601
as % of Refunded	4.396%
Escrow Arbitrage	(\$14,292)
Escrow Arbitrage Ratio	7.3%
Approx. Value of 1 b.p.	\$2,103

### Series of 2010 Refunding Cash Flow Comparison

FYE	Existing Net D/S	Proposed Net D/S	Cash Flow Savings	NPV Savings
2022	\$520,864	\$498,584	\$22,280	\$22,172
2023	\$521,801	\$502,520	\$19,281	\$18,935
2024	\$517,912	\$499,099	\$18,812	\$18,234
2025	\$522,650	\$502,239	\$20,411	\$19,549
2026	\$521,332	\$497,975	\$23,357	\$22,111
2027	\$454,447	\$433,315	\$21,132	\$19,760
2028	\$444,241	\$425,443	\$18,798	\$17,364
2029	\$415,053	\$394,379	\$20,675	\$18,876
2030	\$104,200	\$80,825	\$23,375	\$21,085
2031	\$993,346	\$974,865	\$18,481	\$16,485
2032	\$0	\$0	\$0	\$0
2033	\$0	\$0	\$0	\$0
2034	\$0	\$0	\$0	\$0
2035	\$0	\$0	\$0	\$0
2036	\$0	\$0	\$0	\$0
2037	\$0	\$0	\$0	\$0
2038	\$0	\$0	\$0	\$0

#### Interest Rate Sensitivity on Refunding Issue

Rate Impact	NPV Savings	% of Refunded
+30 b.p. (+0.30%)	\$142,554	3.033%
+20 b.p. (+0.20%)	\$160,024	3.405%
+10 b.p. (+0.10%)	\$177,697	3.781%
<b>Current Market</b>	<b>\$195,983</b>	<b>4.170%</b>
-10 b.p. (-0.10%)	\$214,155	4.556%
-20 b.p. (-0.20%)	\$232,332	4.943%
-30 b.p. (-0.30%)	\$250,462	5.329%

NPV Savings reflects net local share where applicable; Est. NPV Savings includes residual bond rounding.

## Refunding Overview: Series of 2016, Savings Allocation Comparison

	Series 2021 (2016), Level	Series 2021 (2016), Upfront	Series 2021 (2016), Shorten
Net Present Value Savings (est.)	\$195,983	(\$134)	\$204,976
Projects Funded at Closing (est.)	0	205,000	0
Total NPV Savings	\$195,983	\$204,866	\$204,976
as % of Refunded Bonds (\$4,700,000.00)	4.17%	4.36%	4.36%
Total Gross Savings (Cash Flow)	\$206,601	\$205,041	\$223,563
as % of Refunded Bonds	4.40%	4.36%	4.76%
Avg Life	4.89 Years	4.96 Years	4.76 Years

### Estimated Refunding Cash Flow Comparison

FYE	Existing D/S	Proposed D/S	Cash Flow Savings	Proposed D/S	Cash Flow Savings	Proposed D/S	Cash Flow Savings
2022	\$520,864	\$498,584	\$22,280	\$520,161	\$703	\$517,420	\$3,444
2023	\$521,801	\$502,520	\$19,281	\$520,020	\$1,780	\$520,981	\$820
2024	\$517,912	\$499,099	\$18,812	\$516,178	\$1,734	\$516,998	\$914
2025	\$522,650	\$502,239	\$20,411	\$523,605	(\$955)	\$519,669	\$2,981
2026	\$521,332	\$497,975	\$23,357	\$523,605	(\$2,272)	\$519,669	\$1,663
2027	\$454,447	\$433,315	\$21,132	\$453,838	\$609	\$449,902	\$4,545
2028	\$444,241	\$425,443	\$18,798	\$445,591	(\$1,350)	\$441,655	\$2,586
2029	\$415,053	\$394,379	\$20,675	\$414,151	\$902	\$414,854	\$199
2030	\$104,200	\$80,825	\$23,375	\$104,861	(\$662)	\$100,832	\$3,368
2031	\$993,346	\$974,865	\$18,481	\$993,795	(\$448)	\$790,303	\$203,043
2032	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2033	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2034	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2035	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2036	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2037	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2038	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2039	\$0	\$0	\$0	\$0	\$0	\$0	\$0

NPV Savings reflects net local share where applicable; Est. NPV Savings includes residual bond rounding.