



Avon Grove School District

Cash Settled Forward Swap for Hedging Future Capital Project Financings

October 18, 2018 Meeting

John Frey, *Director*, PFM Financial Advisors LLC

Wes Hall, *Senior Analyst*, PFM Financial Advisors LLC

Jeff Pearsall, *Managing Director*, PFM Swap Advisors LLC

George Hu, *Senior Managing Consultant*, PFM Swap Advisors LLC

PFM Swap Advisors LLC
PFM Financial Advisors LLC

213 Market Street
Harrisburg, PA 17101

717-232-2723
pfm.com



Summary of Rate Sensitivity Analysis

| Fiscal Year Ending | 1 Current Rates - 100bps | | 2 Current Rates - 50bps | | 3 Current Rates | | 4 Current Rates + 50bps | | 5 Current Rates + 100bps | |
|---|-----------------------------|--------------------------------|----------------------------|--------------------------------|------------------------|--------------------------------|----------------------------|--------------------------------|-----------------------------|--------------------------------|
| | Total Proposed Net D/S | New Mills Required for Net D/S | Total Proposed Net D/S | New Mills Required for Net D/S | Total Proposed Net D/S | New Mills Required for Net D/S | Total Proposed Net D/S | New Mills Required for Net D/S | Total Proposed Net D/S | New Mills Required for Net D/S |
| 2019 | 3,226,756 | 0.500 | 3,226,756 | 0.540 | 3,226,756 | 0.580 | 3,226,756 | 0.620 | 3,226,756 | 0.670 |
| 2020 | 3,786,152 | 0.490 | 3,786,152 | 0.540 | 3,786,152 | 0.580 | 3,786,152 | 0.620 | 3,786,152 | 0.660 |
| 2021 | 5,017,133 | 0.490 | 5,171,510 | 0.530 | 5,326,116 | 0.580 | 5,481,387 | 0.620 | 5,636,841 | 0.660 |
| 2022 | 6,341,943 | 0.490 | 6,667,675 | 0.530 | 6,991,881 | 0.570 | 7,317,431 | 0.620 | 7,643,227 | 0.660 |
| 2023 | 9,054,472 | 0.490 | 9,434,516 | 0.530 | 9,825,672 | 0.570 | 10,223,769 | 0.620 | 10,631,922 | 0.660 |
| 2024 | 9,053,701 | | 9,436,301 | | 9,826,074 | | 10,224,163 | | 10,633,459 | |
| 2025 | 9,054,910 | | 9,434,711 | | 9,822,886 | | 10,225,496 | | 10,630,431 | |
| 2026 | 9,051,595 | | 9,433,423 | | 9,824,915 | | 10,226,930 | | 10,632,570 | |
| 2027 | 9,053,870 | | 9,437,548 | | 9,827,210 | | 10,223,648 | | 10,629,923 | |
| 2028 | 9,053,421 | | 9,434,009 | | 9,826,934 | | 10,227,959 | | 10,635,034 | |
| 2029 | 9,053,950 | | 9,435,100 | | 9,824,850 | | 10,224,000 | | 10,635,400 | |
| 2030 | 9,051,400 | | 9,433,438 | | 9,825,250 | | 10,227,688 | | 10,633,650 | |
| 2031 | 9,052,300 | | 9,435,938 | | 9,825,500 | | 10,226,738 | | 10,632,850 | |
| 2032 | 9,054,000 | | 9,436,963 | | 9,826,875 | | 10,224,425 | | 10,632,850 | |
| 2033 | 9,051,200 | | 9,436,063 | | 9,823,750 | | 10,224,788 | | 10,632,450 | |
| 2034 | 9,053,500 | | 9,437,675 | | 9,825,375 | | 10,226,725 | | 10,630,450 | |
| 2035 | 9,055,400 | | 9,436,238 | | 9,825,875 | | 10,224,275 | | 10,630,500 | |
| 2036 | 9,051,600 | | 9,436,188 | | 9,824,500 | | 10,226,338 | | 10,631,100 | |
| 2037 | 9,051,700 | | 9,436,850 | | 9,825,375 | | 10,226,675 | | 10,630,750 | |
| 2038 | 9,055,100 | | 9,432,663 | | 9,822,625 | | 10,224,188 | | 10,632,800 | |
| 2039 | 9,051,400 | | 9,432,950 | | 9,825,250 | | 10,222,638 | | 10,630,600 | |
| 2040 | 9,055,100 | | 9,436,813 | | 9,827,125 | | 10,225,513 | | 10,632,350 | |
| 2041 | 9,055,600 | | 9,433,575 | | 9,827,250 | | 10,226,300 | | 10,631,100 | |
| 2042 | 9,052,500 | | 9,432,563 | | 9,824,625 | | 10,223,625 | | 10,634,750 | |
| TOTAL | 199,438,704 | 2.460 | 207,555,613 | 2.670 | 215,838,821 | 2.880 | 224,317,604 | 3.100 | 232,937,916 | 3.31 |
| Total Par Amount | \$121,005,000 | | \$121,090,000 | | \$121,170,000 | | \$121,265,000 | | \$121,345,000 | |
| Total Project Funds | \$127,000,000 | | \$127,000,000 | | \$127,000,000 | | \$127,000,000 | | \$127,000,000 | |
| Contingency | | | | | | | | | | |
| 2018 | 0bps | | 0bps | | 0bps | | 0bps | | 0bps | |
| 2019 | 0bps | | 0bps | | 0bps | | 0bps | | 0bps | |
| 2020 | -100bps | | -50bps | | 0bps | | 50bps | | 100bps | |
| 2021 | -100bps | | -50bps | | 0bps | | 50bps | | 100bps | |
| 2022 | -100bps | | -50bps | | 0bps | | 50bps | | 100bps | |
| Change to Base Scenario | | | | | | | | | | |
| Increase / (Decrease) in Millage | (0.42) | | (0.21) | | N/A | | 0.22 | | 0.43 | |
| Increase / (Decrease) in Annual Debt Service | (771,199) | | (391,156) | | N/A | | 398,098 | | 806,251 | |
| Increase / (Decrease) in P&I Repayment | (16,400,117) | | (8,283,208) | | N/A | | \$8,478,783 | | \$17,099,094 | |

Note: Table provided by RBC. Based on current interest rates as of 10/10/2018, preliminary, subject to change.



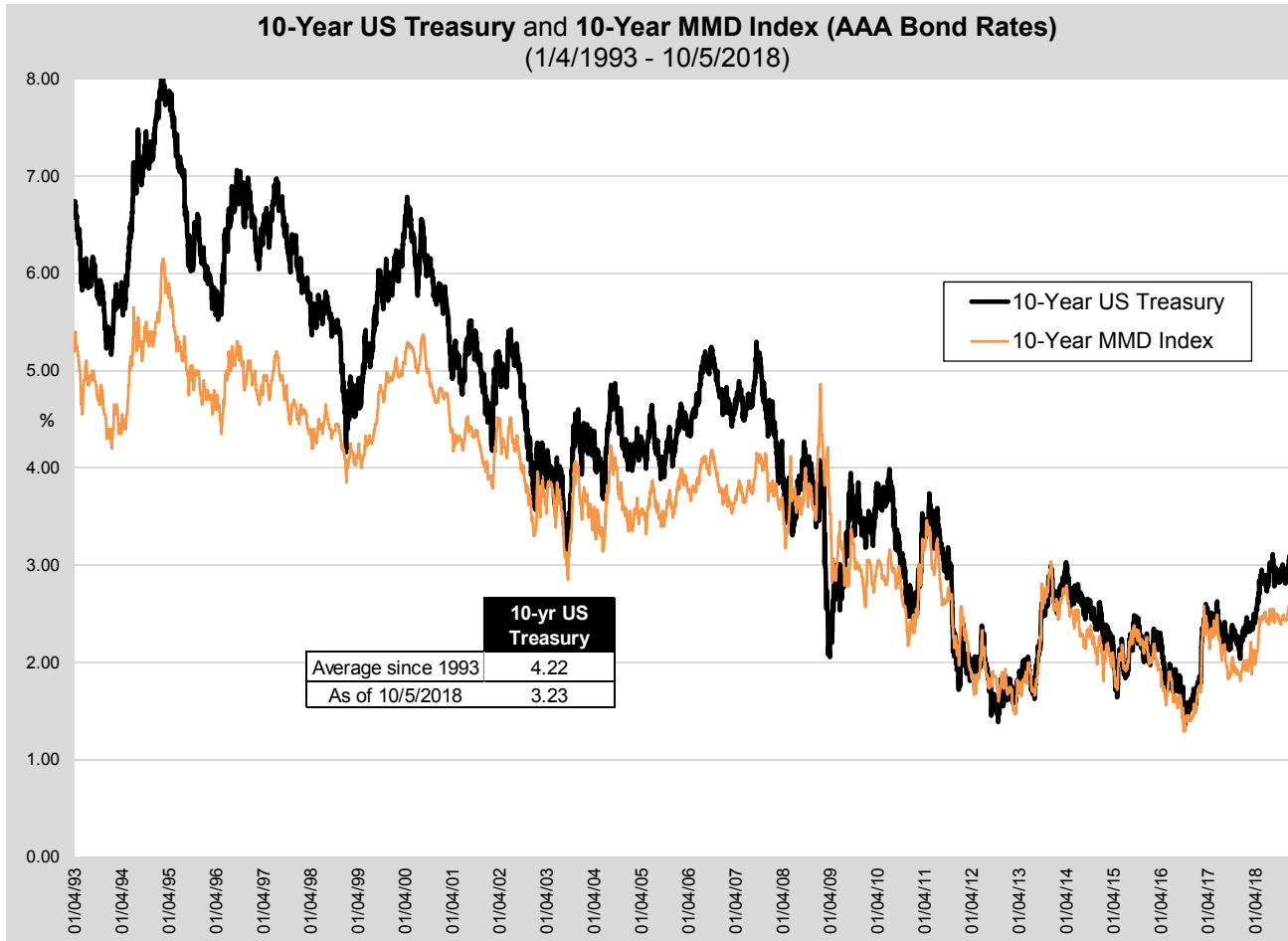
Estimated Preliminary Financing Plan* : *For Discussion Purposes*

Estimated Timing of Bond Closing & Approx Project Fund Amounts

| | | | |
|--|---------------|------------------------|---|
| Existing 2006 Parameters Bond Resolution | December 2018 | \$ 10.0 Million | |
| | January 2019 | \$ 10.0 Million | |
| New Parameters Bond Resolution will be needed | June 2020 | \$ 35.0 Million | Discussion on two cash settled hedges of \$30 Million each (Swap Resolution would be needed if the District decides to move forward with hedges) |
| | June 2021 | \$ 35.0 Million | |
| | Spring 2022 | \$ 37.0 Million | |
| Total Est Project Funds | | \$127.0 Million | |



Interest Rates & Bloomberg Survey on 10-year US Treasury



Bloomberg Survey Forecast October 2018 Survey*

Median Forecasts

| | | 10-yr US Treasury |
|------|---------|-------------------|
| 2018 | 4th Qtr | 3.17% |
| 2019 | 1st Qtr | 3.30% |
| | 2nd Qtr | 3.33% |
| | 3rd Qtr | 3.42% |
| | 4th Qtr | 3.49% |
| 2020 | 1st Qtr | 3.52% |
| | 2nd Qtr | 3.57% |
| | 3rd Qtr | 3.60% |
| | 4th Qtr | 3.56% |
| 2021 | 1st Qtr | 3.65% |

*Consists of economic forecasts and projections from approximately 30-60 investment banking firms and financial institutions.

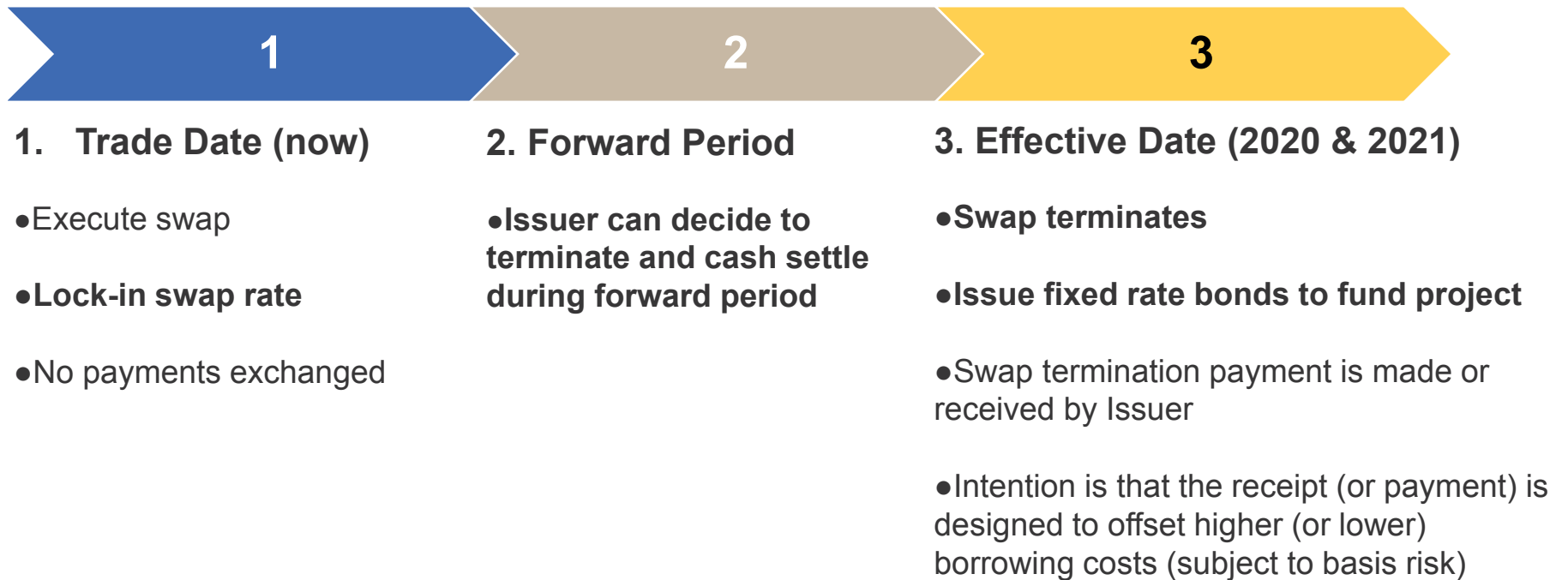


Overview of a Cash Settled Forward Swap

- ◆ A cash settled forward swap is a transaction that issuers can consider to **hedge against rising interest rates on a future issuance of bonds**
 - Issuers need to consider the trade-off between hedging interest rate risk with other risks inherent to the swap transaction
- ◆ **“Forward”**: Locks-in a swap rate to start in the future at the effective date (June of 2020 & 2021) to correspond with the expected future issuance of bonds
- ◆ **“Cash Settled”**: Requires the issuer to “settle” the swap in the future when debt is issued or before
 - **Mandatory Termination on the swap effective date (2020 & 2021)**
 - The swap is terminated and the Issuer either owes a payment or receives a payment depending on the movement of swap rates
 - Therefore, the Issuer is only in the swap for that 2-3 year period until the Mandatory Termination date



Timeline of a Cash Settled Forward Swap





Concept of Hedge & Termination Payment at Effective Date (2020 & 2021)

◆ If swap rates are higher than the executed swap rate:

- District receives a termination payment from RBC
- That receipt is used by District to reduce the amount of bonds issued to help offset the higher bond rates*

◆ If swap rates are lower than the executed swap rate:

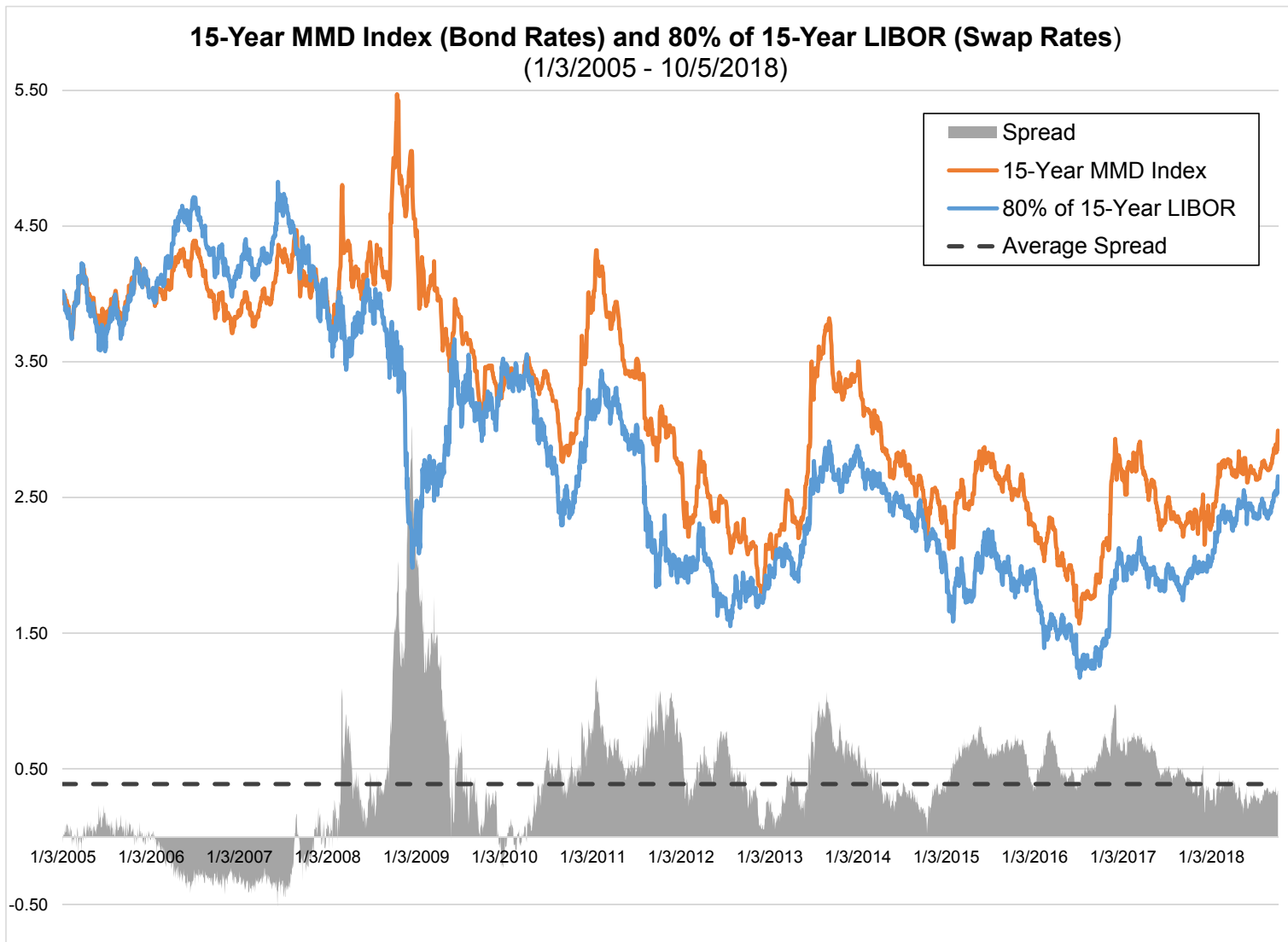
- District owes a termination payment to RBC
- That payment is made by District cash (therefore reducing the cash amount reserved for the project) and causing more bonds to be issued to fund the project, **or by a non-PA Debt Act financing.**
- District would then issue fixed rate bonds at lower bond rates*

◆ In both instances, the District should expect to achieve *similar* all-in borrowing costs that were available at the Trade Date.*

* There is no assurance that swap rates will move in lock-step with the Issuer's actual borrowing costs (Basis Risk). Historically, LIBOR Swap Rates and MMD Index have been correlated but there are times when markets move independently (example Fall 2008).



Basis Risk - Correlation of MMD Index and LIBOR Swap Rates

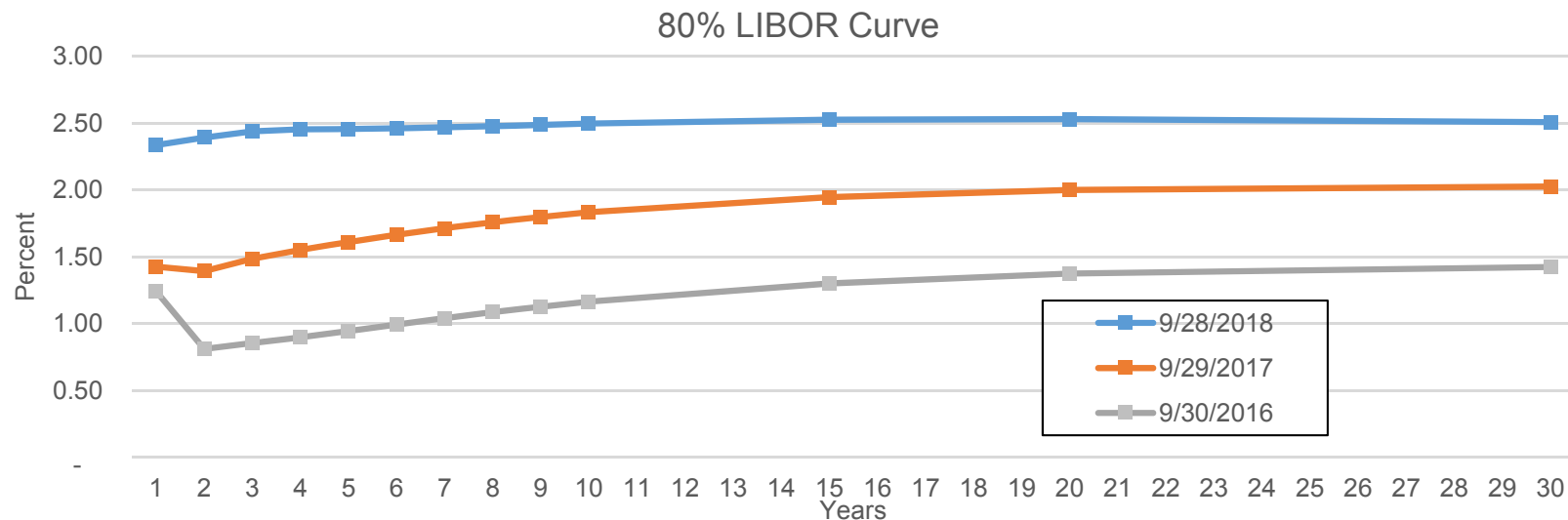


- Swap and bond rates have historically been correlated
- **Basis Risk:** swap and bond rates do not move in lock-step with each other
- Credit Spreads - Changes in Issuer's spreads to MMD Index are not hedged
- **Tax Risk – a form of Basis Risk** - if value of tax-exemption is reduced, then the tax-exempt MMD Index and rates that the Issuer would issue on its bonds may increase relative to taxable LIBOR swap rates



80% LIBOR Swap Curve

- Below is a chart of 80% of LIBOR swap rates for the last day of September each year for the last three years
 - Short term rates have risen more significantly than long term rates since the Fed began tightening in late 2015**
- The spread between 2 and 10 year swap rates has decreased significantly:
 - 9/28/2018 spread: 0.10%
 - 9/29/2017 spread: 0.44%
 - 9/30/2016 spread: 0.35%
- The result has been a **flattening of the yield curve and lower forward premiums** for cash settle swaps



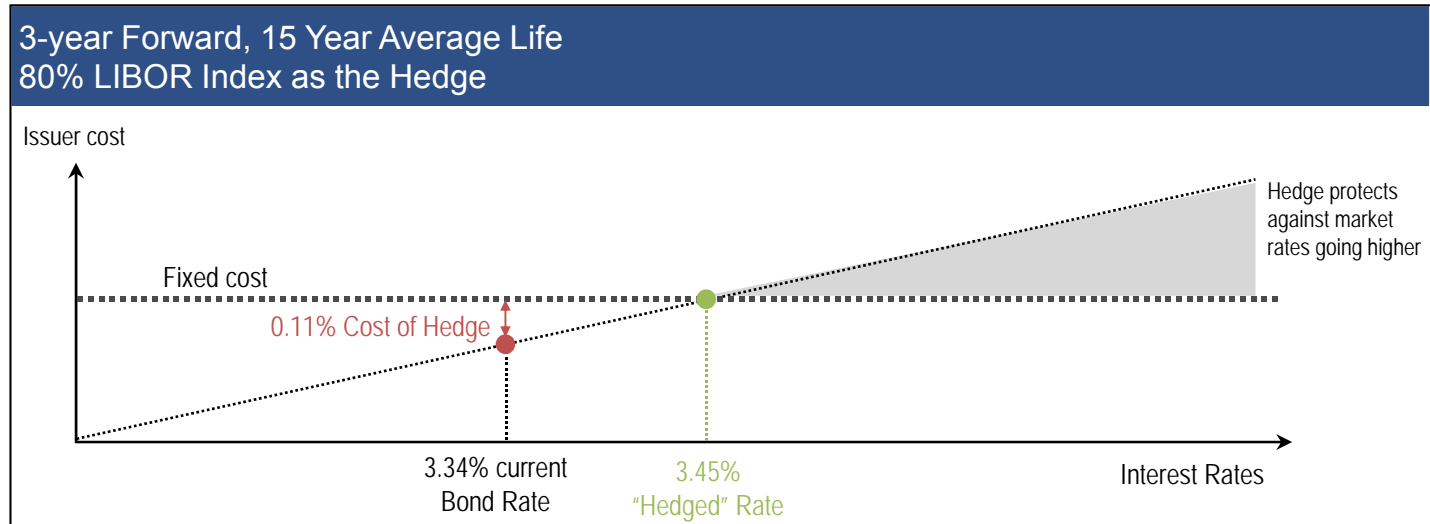


“Cost” of the Hedge

- ◆ The executed swap rate would take into account :
 - Current swap rate + forward premium + bank counterparty spread & other professional fees
- ◆ **Forward premium** – premium to lock-in a rate that starts in the future: determined by length of forward period, shape of yield curve, structure & term of swap.
 - Under current market conditions: approx. 3-4 basis points (0.03%-0.04%) (provided by RBC)
- ◆ **Bank counterparty spread & professional fees**
 - Preliminary estimate of 8-9 basis points (0.08%-0.09%)
 - Actual spread & fees would be determined and disclosed prior to execution
- ◆ **Therefore, at the effective date, swap rates would have to increase by more 0.11%-0.13% or the District would owe a termination payment.**
 - Note: The Counterparty will make an upfront payment to the District to cover the professional fees (since the fees are built into the executed swap rate).



Hedge Illustration



| | |
|----------------------|--|
| “Hedged Rate” | 15 Year MMD of 2.99% + 35 bps issuer spread to MMD = 3.34% Bond market rate + 0.11% forward premium & dealer spread = 3.45% all-in Hedged borrowing rate |
| On Bond Pricing Date | <ul style="list-style-type: none"> ▪ Swap terminated at market value; Issuer makes or receives a payment at bond closing <ul style="list-style-type: none"> – If applicable LIBOR swap rates rise more than 11 bps and the market value of the swap is positive, RBC makes a payment to Issuer – If applicable LIBOR swap rates do not rise more than 11 bps and the market value of the swap is negative, Issuer makes a payment to RBC |
| Result | Issuer achieves (approximately) today’s interest rates plus the hedge cost which is incorporated into the bond deal, subject to basis risk |



Swap Termination & Illustration of the \$60 Million Hedge: (\$30 Million to 6/2020 & \$30 Million to 6/2021)

Columns 4-6:
Assumes Lock-Step Movement in Bond and Swap Rates (Swap rates changed by 1.00% and Bond rates changed by 1.00%)

Note: For these purposes, assumes lock-step change in swap and bond rates (coupon and yield) and inclusive of approx. termination payments. Results will vary depending on market conditions and actual bond and coupon structuring at the time of issuance. A termination payment/receipt will be due regardless of bond closing. All rates and amounts are for indication purposes only.

| | 1 | 2 | 3 | 4 | 5 | 6 |
|--|--------------------------------|---------------|---------------|--|----------------------|----------------------|
| | Bonds Only No Swaps | | | Bonds With Swaps | | |
| Change in Rates in 2020 and 2021: | Change in Bond Rates | | | Change in Bond & Swap Rates | | |
| | -1.00% | 0.00% | +1.00% | -1.00% | 0.00% | +1.00% |
| Swap Termination Amount: | \$0 | \$0 | \$0 | SD Pays | SD Pays | SD Receives |
| Par*: | \$59,830,000 | \$60,000,000 | \$60,170,000 | \$8,737,800 | \$705,305 | \$5,873,233 |
| TIC (True Interest Cost): | 3.51% | 4.50% | 5.50% | \$68,090,000 | \$60,675,000 | \$54,585,000 |
| Approx. Total Debt Service: | \$96,815,902 | \$106,781,485 | \$116,958,685 | 4.64% | 4.61% | 4.55% |
| | | | | \$110,193,569 | \$107,973,548 | \$106,087,260 |

* For comparison purposes, each scenario is sized to provide approx. \$63,000,000 of proceeds
Note: Assumes bond settlement and swap terminations on June 1, 2020 and June 1, 2021

| FYE: | Debt Service: | | | Debt Service: | | |
|---------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 6/30/2021 | 1,101,148 | 1,379,239 | 1,658,889 | 1,256,798 | 1,395,052 | 1,501,864 |
| 6/30/2022 | 2,301,959 | 2,883,376 | 3,468,051 | 2,618,976 | 2,915,751 | 3,146,601 |
| 6/30/2023 | 2,401,433 | 3,008,033 | 3,618,033 | 2,731,833 | 3,041,783 | 3,282,933 |
| 6/30/2024 | 2,401,185 | 3,007,685 | 3,617,585 | 2,731,585 | 3,041,435 | 3,282,485 |
| 6/30/2025 | 2,400,928 | 3,007,328 | 3,617,128 | 2,731,328 | 3,041,078 | 3,282,028 |
| 6/30/2026 | 2,400,705 | 3,007,005 | 3,616,705 | 2,731,105 | 3,040,755 | 3,281,605 |
| 6/30/2027 | 2,400,470 | 3,006,670 | 3,616,270 | 2,730,870 | 3,040,420 | 3,281,170 |
| 6/30/2028 | 2,400,225 | 3,006,325 | 3,615,825 | 2,730,625 | 3,040,075 | 3,280,725 |
| 6/30/2029 | 2,399,950 | 3,005,950 | 3,615,350 | 2,730,350 | 3,039,700 | 3,280,250 |
| 6/30/2030 | 5,898,200 | 6,262,000 | 6,655,750 | 6,708,800 | 6,344,500 | 6,039,350 |
| 6/30/2031 | 5,897,100 | 6,270,000 | 6,656,200 | 6,712,600 | 6,340,250 | 6,042,650 |
| 6/30/2032 | 5,895,100 | 6,269,000 | 6,654,650 | 6,709,600 | 6,337,250 | 6,035,150 |
| 6/30/2033 | 5,892,000 | 6,268,750 | 6,655,350 | 6,709,600 | 6,344,750 | 6,036,250 |
| 6/30/2034 | 5,892,500 | 6,268,750 | 6,657,400 | 6,707,300 | 6,342,250 | 6,039,900 |
| 6/30/2035 | 5,891,300 | 6,263,625 | 6,655,050 | 6,712,300 | 6,339,500 | 6,035,500 |
| 6/30/2036 | 5,893,100 | 6,267,750 | 6,657,400 | 6,704,400 | 6,336,000 | 6,037,300 |
| 6/30/2037 | 5,892,600 | 6,265,500 | 6,653,550 | 6,703,400 | 6,331,250 | 6,034,400 |
| 6/30/2038 | 5,889,600 | 6,271,250 | 6,652,600 | 6,703,800 | 6,334,500 | 6,035,900 |
| 6/30/2039 | 5,888,800 | 6,264,500 | 6,653,350 | 6,705,200 | 6,335,000 | 6,035,750 |
| 6/30/2040 | 5,889,800 | 6,264,750 | 6,654,600 | 6,707,200 | 6,332,250 | 6,033,050 |
| 6/30/2041 | 5,892,200 | 6,266,125 | 6,655,150 | 6,709,400 | 6,330,625 | 6,031,750 |
| 6/30/2042 | 5,895,600 | 6,267,875 | 6,653,800 | 6,706,500 | 6,329,375 | 6,030,650 |
| TOTAL: | 96,815,902 | 106,781,485 | 116,958,685 | 110,193,569 | 107,973,548 | 106,087,260 |



Project Risk

- ◆ District should have a high level of certainty that the project will proceed as scheduled since a swap termination payment or receipt will occur whether or not the related bond issue closes.
- ◆ If future District Boards decide to downsize, delay or cancel the capital project, District would still have the swap that has a mandatory termination.

- *If swap rates are lower than the executed swap rate:*

District would owe a termination payment and would not have the offsetting interest cost savings since there would be no bonds issued (or fewer bonds issued in the case of a downsized project).



Other Considerations prior to cash settlement:

- Rating Agency discussion / questions
- Board education for new members that may come during swap term (2018-2021)
- Disclosure in District's annual Audit of the swap and its market value (2018-2021)

Other Risks

• Termination, Basis, Tax and Project Risks -

Previously discussed on prior pages. Additionally, the Counterparty could terminate the swap if the District's credit rating falls below a threshold as determined in the final swap documents (generally threshold is triggered if downgraded to BBB+ or below). The District is currently rated AA.

• Market Access Risk

Risk that certain market conditions or disruptions could prevent the District from accessing the bond market and/or securing acceptable financing terms.

• Counterparty Risk











Risk that the Counterparty (Royal Bank of Canada) cannot make the termination payment that may be due to the District. The Counterparty is rated Aa2/AA-/AA from Moody's, S&P, and Fitch respectively.

• Legislative Risk

Risk that future Pennsylvania legislation impacts the District's ability to issue General Obligation Bonds for the Project or amends legislation that impacts pre-existing swaps.



Recent PFM Advised* Cash Settled Hedges for PA Issuers

| | | | | |
|---|---|--|---|--|
|  <p>\$40,000,000 \$40,000,000 \$80,000,000</p> <p>2 Cash Settled Swaps</p>  <p>Swap Advisor September 2017</p> |  <p>\$29,850,000</p> <p>Cash Settled Swap</p>  <p>Swap Advisor December 2017</p> |  <p>\$25,000,000</p> <p>Cash Settled Swap</p>  <p>Swap Advisor March 2018</p> |  <p>\$40,000,000 \$40,000,000 \$80,000,000</p> <p>2 Cash Settled Swaps</p>  <p>Swap Advisor April 2018</p> |  <p>\$ 50,000,000 \$ 50,000,000 \$100,000,000</p> <p>2 Cash Settled Swaps</p>  <p>Swap Advisor October 2018</p> |
| <ul style="list-style-type: none"> District wanted to hedge two new money bond issues for construction of a new high school Final term: 6/1/39 Cash settle dates: 4/1/2019 & 4/1/2020 | <ul style="list-style-type: none"> District wanted to hedge a future refunding because new tax regulations prohibit advance refundings Final term: 10/15/2031 Cash settle date: 4/15/2020 | <ul style="list-style-type: none"> Township wanted to hedge a future new money financing Final term: 12/1/2040 Cash settle date: 6/1/2019 | <ul style="list-style-type: none"> District wanted to hedge two new money bond issues for new middle school & renovations to several elementary schools Final term: 4/1/2044 Cash settle dates: 8/1/2019 & 8/1/2020 | <ul style="list-style-type: none"> District wanted to hedge two new money bond issues Final term: 1/15/2050 Cash settle dates: 6/1/2020 & 6/1/2021 |
| <ul style="list-style-type: none"> Swap #1 terminated 9/19/2018. District received a termination payment of \$2,375,000. | | | | |

*Swap advisory services are provided by PFM Swap Advisors LLC which is registered as a municipal advisor with both the MSRB and SEC under the Dodd-Frank Act of 2010, and as a commodity trading advisor with the Commodity Futures Trading Commission.



Questions?



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