



\$443,165,000*

Massachusetts Department of Transportation
Metropolitan Highway System Revenue Refunding Bonds (Subordinated)
Commonwealth Contract Assistance Secured
\$371,380,000 Variable Rate (Term Rate), 2018 Series B
\$71,785,000 2018 Series C

Phase Two: De-Risking Strategies for the Variable Rate Bond and Swap Portfolios

Board of Directors Meeting

David W. Pottier, Chief Financial Officer

October 15, 2018

* Preliminary, subject to change.

2010 Series A-3 through A-6 Refunding & Swap Termination

- Proposed financing structure: 2018 Series B current refunding of the Subordinated 2010 Series A-3 - A-6 Bonds and suspend the associated UBS swap
 - Issue soft put refunding bonds: \$371,380,000¹ Revenue Refunding Bonds (Subordinated) Commonwealth Contract Assistance Secured, 2018 Series B with 1/1/2023 Soft Put Date
 - ❖ Refund variable rate bonds: \$371,380,000 Subordinated Variable Rate Demand Obligations 2010 Series A-3, A-4, A-5 and A-6 (“2010 A-3 through A-6 Bonds”)
 - ❖ Partially Terminate \$371,380,000 of notional amount of UBS swap associated with 2010 A-3 through A-6 Bonds and suspend (turn off) payments on the swap through the Soft Put Date
 - ❖ Pay fixed rates on the 2018 Series B Bonds through the Soft Put Date
 - ❖ Remarket 2018 Series B Bonds or refund with variable rate bonds on Soft Put Date when swap reactivates and payments on swap restart
 - Novate 2010 Series A-3 through A-6 swap to new counterparty
 - Projected to generate savings of \$4.7 million¹ on net present value basis

¹ Based on September 27, 2018 rates, subject to change.

2010 Series A-2 Refunding & Swap Termination

- Proposed financing structure: 2018 Series C traditional fixed-rate current refunding of Subordinated 2010 Series A-2 and termination of associated UBS swap
 - Issue fixed rate refunding bonds: \$71,785,000¹ Revenue Refunding Bonds (Subordinated) Commonwealth Contract Assistance Secured, 2018 Series C
 - ❖ Refund variable rate bonds: \$83,100,000 Subordinated Variable Rate Demand Obligations 2010 Series A-2 (“2010 A-2 Bonds”)
 - ❖ Terminate \$83,100,000 of notional amount of UBS swap associated with 2010 A-2 Bonds
 - ❖ Eliminate subordinated basis reserve requirement¹, release \$27.63mm into transaction
 - ❖ Projected to generate savings of \$338,000² on net present value basis

¹ Subject to rating agency feedback.

² Based on September 27, 2018 rates, subject to change.

Transaction Highlights

- Swap termination costs paid for from combined savings on refunding transactions
- Reduction of \$83.1 million in outstanding swap notional amount
- Combined reduction of \$67.17 million in negative mark-to-market (MTM) on swap portfolio's total \$252.1 million MTM (27%) at no cost to MassDOT on net present value basis
- Refunding economics primarily impacted by:
 - Relationship between benchmark tax-exempt MMD rates and taxable LIBOR swap rates
 - Credit spreads on i) fixed rate refunding bonds and ii) variable rate refunded bonds
 - Swap termination discounts provided by UBS
- Transaction meets Risk Management (§ 8) and Refunding (§ 14) guidelines of MassDOT's Debt Issuance and Management Policy

Swap Portfolio De-risking Highlights

Phase One Highlights

- Completed May 10, 2018
- Terminated two swaps
- Terminated \$137.855 million notional amount
- Swap portfolio reduced by 15.3% on notional basis (\$900 million to \$762.145 million)
- Eliminated \$33.9 million in negative MTM
- Swap portfolio reduced by 15.3% on MTM basis (\$306.7 million to \$272.865 million)
- Received 4% discount = \$1.36 million
- NPV savings = \$2.874 million

Phase One: Swap De Risking and Transaction Summary

Swap ID	Notional	Full MTM ¹	Terminated Amount	MTM Reduction ²	Transaction NPV Savings
UBS SR A-1	207,665,000	-82,315,000	-	-	-
UBS Sub A-2	83,100,000	-30,590,000	-	-	-
UBS Sub A-3-A-6	371,380,000	-157,030,000	-	-	-
JPM Swap	100,000,000	-2,930,000	-	-	-
Phase One Terminations					
UBS SR A-1	43,625,000	-10,375,000	-10,375,000	3.382%	879,485
UBS SR A-1	94,230,000	-23,530,000	-23,530,000	7.670%	1,994,630
Total	900,000,000	-306,770,000	-33,905,000	11.052%	2,874,116
Terminated	137,855,000	-33,905,000	-33,905,000	11.052%	2,874,116
Remaining	762,145,000	-272,865,000			

¹ Rates as of 5/1/2018, settlement date of 5/10/2018. Values include accrued interest.

² MTM reduction percentage based on total MTM value on the swap portfolio.

Phase Two Highlights (Combined w/ Phase One)

- To be completed in Dec 2018 or Jan 2019
- Terminate three swaps, suspend payments on one swap for four years
- Terminate \$220.955 million notional amount
- Swap portfolio reduced by 24.5% on notional basis (\$900 million to \$679.045 million)
- Eliminate \$102.775 million in negative MTM
- Swap portfolio reduced by 35.3% on MTM basis (\$291.2 million to \$188.45 million)
- Total NPV savings = \$7.949 million

Phase Two: Swap De Risking and Transaction Summary

Swap ID	Notional	Full MTM ¹	Terminated Amount	MTM Reduction ²	Transaction NPV Savings
UBS SR A-1	207,665,000	-77,730,000	-	-	-
JPM Swap	100,000,000	-2,175,000	-	-	-
Phase Two Termination (A-2) & Suspension (A-3-A-6)					
UBS Sub A-2	83,100,000	-28,775,000	-28,775,000	9.881%	335,761
UBS Sub A-3-A-6	371,380,000	-148,640,000	-40,095,000	13.768%	4,739,797
Phase One Terminations (A-1 & A-7)³					
UBS SR A-1	43,625,000	-10,375,000	-10,375,000	3.563%	879,485
UBS SR A-7	94,230,000	-23,530,000	-23,530,000	8.080%	1,994,630
Total	900,000,000	-291,225,000	-102,775,000	35.291%	7,949,674
Terminated	220,955,000	-102,775,000	-102,775,000	35.291%	7,949,674
Remaining	679,045,000	-188,450,000			

¹ Rates as of 9/27/2018, settlement date of 11/15/2018. Values include accrued interest.

² MTM reduction percentage based on total MTM value on the swap portfolio.

³ Rates as of 5/1/2018, settlement date of 5/10/2018.

Transaction Benefits

- **Continue MassDOT's objective of de-risking debt and swap portfolios**
- **Substitute variable rate debt with fixed rate debt**
- **Terminate and suspend swaps, eliminate \$67.1 million (26.645%) of the swap's \$252.09 million current mark-to-market ("MTM") exposure**
 - Termination payment funded out of tax-exempt refunding bond proceeds
- **UBS Discount on swap terminations**
- **Release \$27.6mm from Basis Reserve, used to downsize refunding bonds**
- **Eliminates VRDB associated risks (only through 1/1/2023 for the 2010 A-3 through A-6 Bonds)**
 - No bank support required
 - No bank covenants
 - No renewal risk of SBPA or LOC agreements
 - No annual liquidity or remarketing fees
- **Eliminates swap associated risks (only through 1/1/2023 for the Sub A-3 through A-6 Swap)**
 - No basis risk: variable rates received on swap do not equal variable rates paid on bonds
 - No tax risk : change in tax rules or other factors increases variable rate costs
 - No forced termination risk upon a downgrade (Sub A-2 Swap only)
- **Reduce exposure to LIBOR replacement in 2021**
- **Creates additional credit capacity (fewer banks providing support on VRDBs)**

Transaction Considerations

- **Transaction is subject to market conditions**

- Moderate to neutral net present value savings
- Relationship between tax-exempt MMD rates and taxable LIBOR swap rates
- Credit spreads
- UBS Discount
- Negative savings at time of sale possible based on market conditions

- **Forego potential positive basis**

- Basis risk is the difference between floating rates received on swaps based on LIBOR and payments made on bonds based on tax-exempt rates
- Basis risk can be positive or negative

- **Forego call flexibility of VRDBs**

- **Remarketing risk at Put Date**

Steps Taken to Date

- Citi selected as Senior Underwriter
- Negotiations with UBS on swap termination / novation
- Draft documents have been prepared by bond counsel and disclosure counsel for the refunding bonds
 - Preliminary Official Statement for Subordinated lien bonds scheduled for distribution following Board approval (late November/early December)
 - Commonwealth disclosure updated upon release of Information Statement (appendix in POS, Information Statement scheduled to be updated December 6th)
 - Twelfth Supplemental Metropolitan Highway System Trust Agreement by and between MassDOT and The Bank of New York Mellon, as trustee
- Rating meetings ready to be scheduled: Moody's / S&P / Fitch (last week of November or first week of December, scheduled around release of Commonwealth's updated Information Statement)

Transaction Schedule

- Sept. 17 – MassDOT Board Meeting, Overview
- Oct. 10 – F&A Meeting
- Oct. 15 – MassDOT Board Meeting, Seek Transaction Approval
- Oct. 18 – Presentation and Vote by State Finance and Governance Board
- Week of Nov. 26 – Ratings Agency Meetings
- Week of Dec. 3 or 10 – Mail POS
- Late Dec./Early Jan. – Retail / Institutional Pricing
- Late Dec./Early Jan. – Closing

Summary of Refunding - Subordinated Bonds¹

Sources:	Full Termination of Swap (Subordinate A2)	Partial 4-year Termination of Swap (Subordinate A3-A6)	Total
Bond Proceeds:			
Par Amount	71,785,000.00	371,380,000.00	443,165,000.00
Premium	9,948,512.15	40,012,481.20	49,960,993.35
	81,733,512.15	411,392,481.20	493,125,993.35
Other Sources of Funds:			
Accrued Interest	1,687,968.75	7,350,229.17	9,038,197.92
Basis Reserve (A3-A6)	22,579,904.00		22,579,904.00
Basis Reserve (A2)	5,052,480.00		5,052,480.00
	29,320,352.75	7,350,229.17	36,670,581.92
	111,053,864.90	418,742,710.37	529,796,575.27
Uses:	Full Termination of Swap (Subordinate A2)	Partial 4-year Termination of Swap (Subordinate A3-A6)	Total
Refunding Escrow Deposits:			
Cash Deposit	84,839,906.25	378,982,973.89	463,822,880.14
Delivery Date Expenses:			
Cost of Issuance	300,000.00	300,000.00	600,000.00
Underwriter's Discount	154,234.70	822,739.99	976,974.69
Net Swap Termination (Subordinate)	23,480,756.95	36,525,771.05	60,006,528.00
Net Swap Termination (Subordinate) - Off Market	2,275,289.11	1,980,776.82	4,256,065.93
	26,210,280.76	39,629,287.86	65,839,568.62
Other Uses of Funds:			
Contingency	3,677.89	130,448.62	134,126.51
	111,053,864.90	418,742,710.37	529,796,575.27

¹ Based on September 27, 2018 rates, subject to change.

Summary of Savings¹

- Transaction structure modified to eliminate subordinated basis reserve requirement moving forward & release \$27.6mm² into transaction
- Savings improved because fewer refunding bonds issued
 - Market conditions are slightly less favorable, NPV savings from original structure of \$1.1mm³ are now -\$1.955mm

	Full Termination of Swap (Subordinate A2)	Partial 4-year Termination of Swap (Subordinate A3-A6)	Total
Dated Date	11/15/2018	11/15/2018	11/15/2018
Delivery Date	11/15/2018	11/15/2018	11/15/2018
Arbitrage Yield	5.697784%	5.697784%	5.697784%
Escrow Yield			
Value of Negative Arbitrage			
Bond Par Amount	71,785,000.00	371,380,000.00	443,165,000.00
True Interest Cost	3.612426%	2.485128%	2.876678%
Net Interest Cost	3.924168%	2.633548%	3.115099%
Average Coupon	4.997617%	5.190000%	5.118219%
Average Life	12.710	4.128	5.518
Weighted Average Maturity	12.775	4.128	5.561
Par amount of refunded bonds	83,100,000.00	371,380,000.00	454,480,000.00
Average coupon of refunded bonds	5.625000%	5.500000%	5.555830%
Average life of refunded bonds	14.889	4.128	6.096
Remaining weighted average maturity of refunded bonds	14.889	4.128	6.096
PV of prior debt	105,097,688.88	407,284,116.15	512,381,805.03
Net PV Savings	338,760.98	4,739,797.37	5,078,558.35
Percentage savings of refunded bonds	0.407655%	1.276266%	1.117444%
Percentage savings of refunding bonds	0.471911%	1.276266%	1.145975%

¹ Based on September 27, 2018 rates, subject to change.

² Original structure released \$5.1 mm from basis reserve fund.

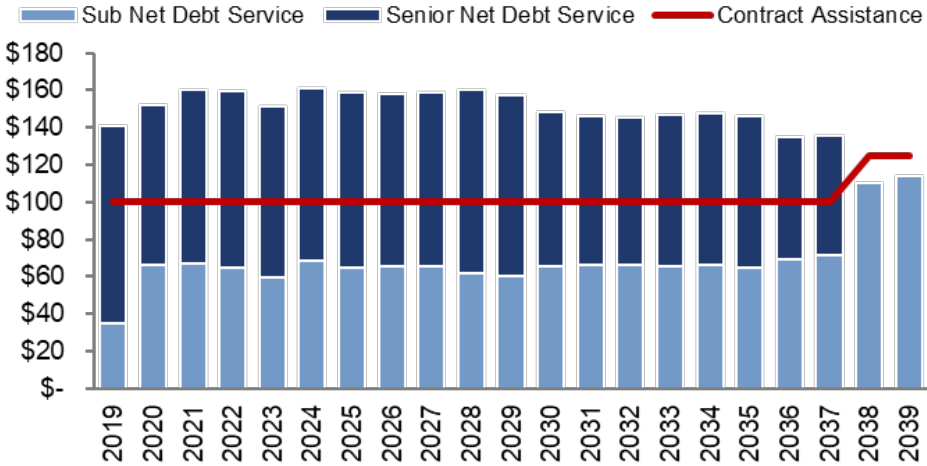
³ NPV savings in original presentation based on August 8, 2018 rates.

Appendix A

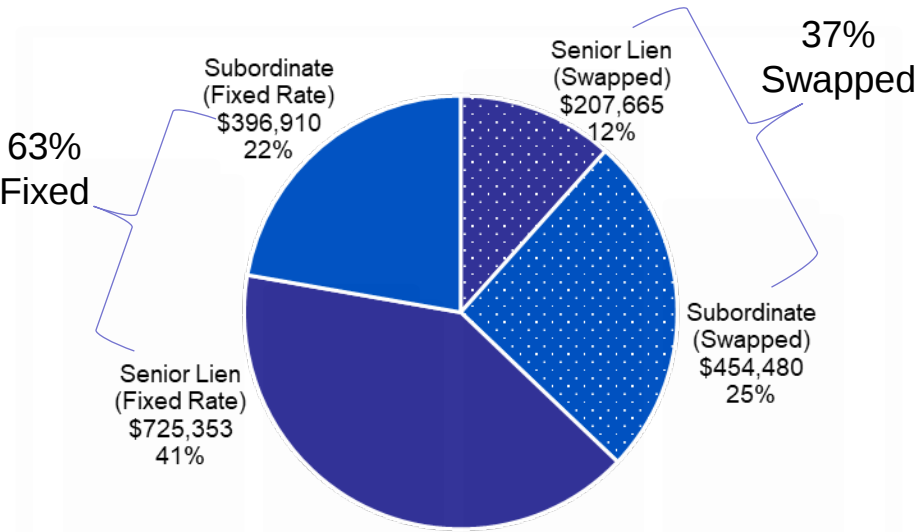
Current MHS Debt Profile - Overall

- There are \$933.0 million of Senior and \$851.4 million Subordinate Lien bonds outstanding (\$840.075 million projected upon completion of the 2018 Series BC refunding)
 - Debt service increases slightly to pay for swap termination costs in addition to the refunded bonds
- All MHS debt is either fixed rate or swapped to fixed
- Capital structure is relatively level through 2029 (after accounting for DSRF releases) and begins to decline thereafter
- Capital structure fully amortizes by 2039
- Senior DSRF currently totals \$109.6 million
- Subordinate DSRF requirement eliminated (after refunding)

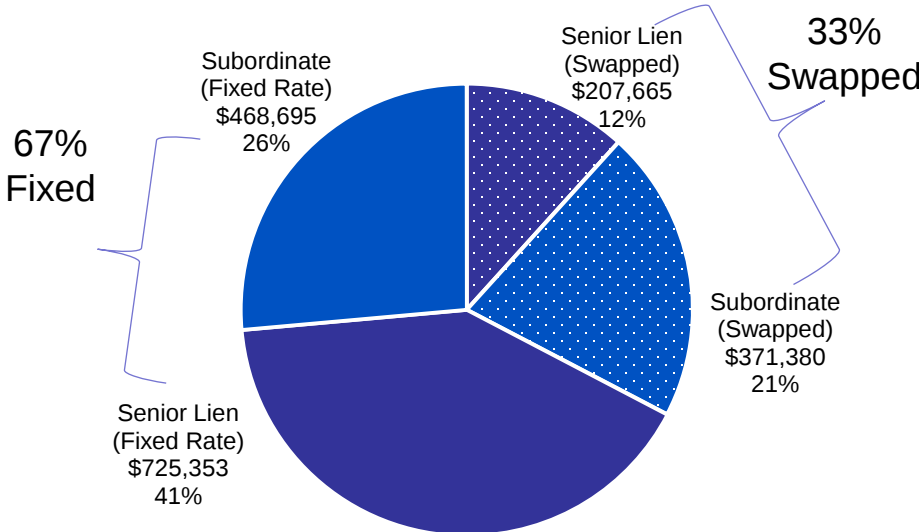
MHS Outstanding Net Debt Service by Lien¹ (\$mm)



MHS Debt Outstanding (\$000)



MHS Pro Forma Debt with 2018BC Refunding Bonds (\$000)

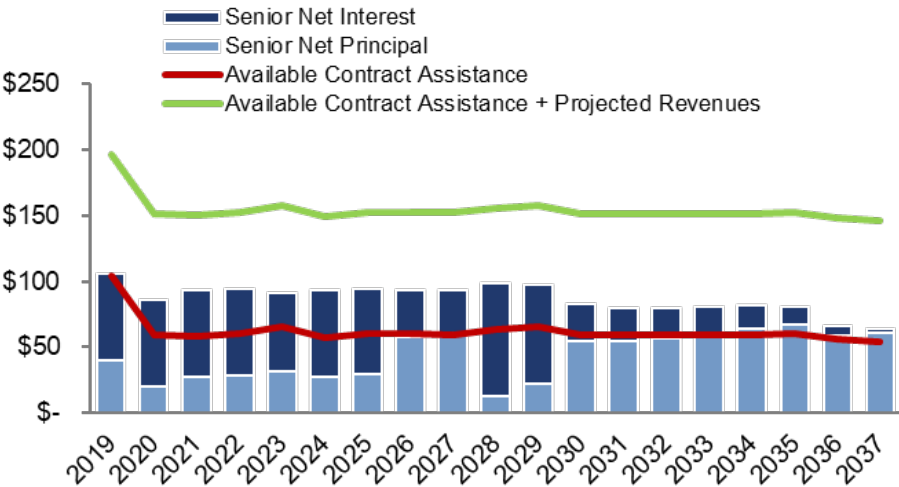


¹ Includes estimated liquidity and remarketing costs of 0.75% for Senior and Subordinate variable rate bonds. Debt service is net of the Debt Service Fund Forward Delivery Agreement, assumed Debt Service Reserve Fund earnings of 1.50% and corpus releases in 2023, 2029, 2036 and 2037 for the Senior Lien and annual releases starting in 2030 for the Subordinate Lien.

Current MHS Debt Profile - Senior and Subordinate Liens

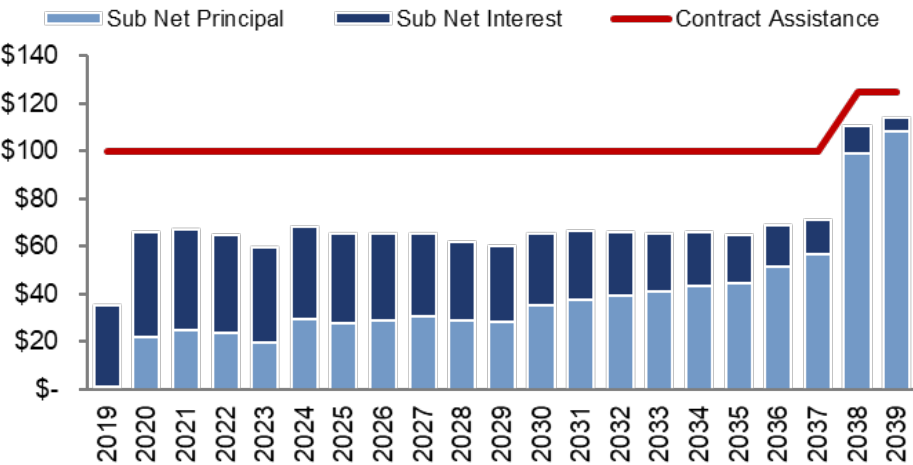
- The Senior Lien is partially covered by a \$25 million pledge of Commonwealth Contract Assistance plus the excess Commonwealth Contract Assistance transferred from the Subordinate Lien
- Capital structure fully amortizes by 2037
- Senior DSRF currently totals \$109.6 million
- Projected revenues cover additional net debt service requirements on the Senior Lien

MHS Net Debt Service - Senior Lien¹ (\$mm)



- Commonwealth Contract Assistance is pledged to Subordinate Lien and covers 100% debt service in every year
- Subordinate Lien debt service is expected to remain well below Dedicated Contract Assistance every year
- Capital structure fully amortizes by 2039
- Subordinate DSRF eliminated (after refunding)

MHS Net Debt Service - Subordinate Lien¹ (\$mm)



¹ Includes estimated liquidity and remarketing costs of 0.75% for Senior and Subordinate variable rate bonds. Debt service is net of the Debt Service Fund Forward Delivery Agreement, assumed Debt Service Reserve Fund earnings of 1.50% and corpus releases in 2023, 2029, 2036 and 2037 for the Senior Lien and annual releases starting in 2030 for the Subordinate Lien.

MHS Outstanding VRDB Debt and Swap Portfolios

■ Current Outstanding Swap Portfolio

Outstanding Swaps as of 10/1/2018

#	Counterpar	Notional	Current Pay Pay Rate (%) ¹	Current Receive Receive Rate (%) ¹	Current Net Rate (%)	Effective Date	Maturity Date	Hedged Bonds	MTM ¹
1	UBS AG	207,665,000	4.750%	4.750%	68% of 1M LIBOR	1.405%	3.345%	07/01/08 01/01/37 2010 SR A-1 & A-2	-75,215,000
2	UBS AG	83,100,000	4.875%	4.875%	68% of 1M LIBOR	1.403%	3.472%	01/01/08 01/01/37 2010 SUB. A-2	-27,695,000
3	UBS AG	371,380,000	4.750%	4.750%	68% of 1M LIBOR	1.403%	3.347%	01/01/09 01/01/39 2010 SUB. A-3- A-6	-147,005,000
4	JPM Chase	100,000,000	SIFMA	1.450%	67% of 3M LIBOR	1.569%	-0.119%	10/01/02 07/01/29 N/A	-2,175,000
Total		762,145,000							-252,090,000

■ Current Outstanding MHS Variable Rate Debt Portfolio

Detailed Summary of Variable Rate Debt as of 10/1/2018

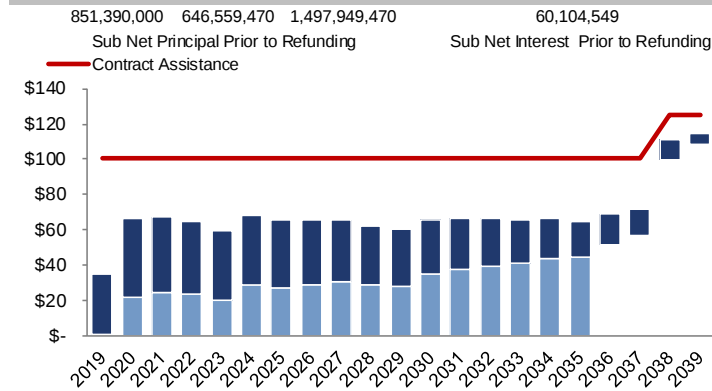
Series	Par Amount	Bond Maturity	Mode	Provider	Expiration	Remaining Term	Bond Maturity	Current Rate ¹	Support Costs/ DP Spread	Tax Gross Up	All-in Variable Rate	Total Synthetic Fixed Rate
Metropolitan Highway System (Senior)												
2010 Series A-1	\$ 100,000,000	1/1/37	VRDB LOC	Citibank	5/27/19	0.82	1/1/37	1.44%	0.42%	-	1.86%	5.21%
2010 Series A-2	\$ 107,665,000	1/1/37	VRDB LOC	Barclays	5/27/20	1.82	1/1/37	1.37%	0.46%	-	1.83%	5.18%
Metropolitan Highway System (Subordinated)												
2010 Series A-2	83,100,000	1/1/37	VRDB LOC	Helaba	4/12/21	2.70	1/1/37	1.36%	0.31%	-	1.67%	5.14%
2010 Series A-3	92,845,000	1/1/39	VRDB LOC	Helaba	4/12/20	1.70	1/1/39	1.56%	0.32%	-	1.88%	5.23%
2010 Series A-4	92,845,000	1/1/39	Direct Purchase	BofA	5/17/19	0.79	1/1/39	1.40%	0.70%	0.45%	2.56%	5.91%
2010 Series A-5	92,845,000	1/1/39	Direct Purchase	BofA	5/15/20	1.79	1/1/39	1.40%	0.80%	0.47%	2.68%	6.03%
2010 Series A-6	92,845,000	1/1/39	VRDB SLOC	SMBC	4/12/19	0.70	1/1/39	1.54%	0.26%	-	1.80%	5.15%
Total	\$ 662,145,000											

¹ Based on September 27, 2018 rates, subject to change.

Current vs. Projected MHS Debt Profile - Subordinate Lien

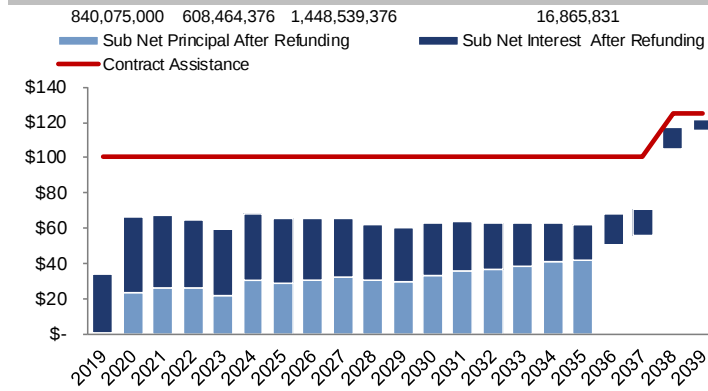
Subordinate Lien Debt Service Prior to Refunding

FY	Subordinate Principal Prior to Refunding ¹	Subordinate Interest Prior to Refunding ¹	Subordinate Debt Service Prior to Refunding ¹	Dedicated Contract Assistance	Additional Offsets to Subordinate Debt Service ¹	Coverage by Contract Assistance
	A	B	C	D = (B + C) / A		
2019	855,000	43,851,775	44,706,775	100,000,000	9,713,533	2.5
2020	22,155,000	45,789,328	67,944,328	100,000,000	1,913,513	1.5
2021	25,260,000	43,965,124	69,225,124	100,000,000	1,996,481	1.5
2022	24,420,000	42,491,675	66,911,675	100,000,000	1,945,319	1.5
2023	20,190,000	41,270,675	61,460,675	100,000,000	1,782,120	1.7
2024	29,950,000	40,261,175	70,211,175	100,000,000	2,054,241	1.5
2025	28,280,000	38,763,675	67,043,675	100,000,000	2,005,258	1.5
2026	29,880,000	37,349,675	67,229,675	100,000,000	2,032,516	1.5
2027	31,545,000	35,855,675	67,400,675	100,000,000	2,060,467	1.5
2028	29,575,000	34,298,425	63,873,425	100,000,000	1,966,295	1.6
2029	29,065,000	32,840,275	61,905,275	100,000,000	1,922,528	1.6
2030	35,935,000	31,387,025	67,322,025	100,000,000	1,846,022	1.5
2031	38,310,000	29,461,719	67,771,719	100,000,000	1,402,597	1.5
2032	40,020,000	27,451,813	67,471,813	100,000,000	1,416,029	1.5
2033	41,830,000	25,353,469	67,183,469	100,000,000	1,612,649	1.5
2034	44,590,000	23,146,563	67,736,563	100,000,000	1,686,005	1.5
2035	45,545,000	20,793,438	66,338,438	100,000,000	1,577,404	1.5
2036	54,195,000	18,399,156	72,594,156	100,000,000	3,599,650	1.4
2037	59,790,000	15,403,813	75,193,813	100,000,000	3,890,400	1.4
2038	105,000,000	12,100,000	117,100,000	125,000,000	6,584,640	1.1
2039	115,000,000	6,325,000	121,325,000	125,000,000	7,096,880	1.1



Subordinate Lien Debt Service After Refunding

FY	Subordinate Principal After Refunding ¹	Subordinate Interest After Refunding ¹	Subordinate Debt Service After Refunding ¹	Dedicated Contract Assistance	Additional Offsets to Subordinate Debt Service ^{1,2}	Coverage by Contract Assistance
	A	B	C	D = (B + C) / A		
2019	1,200,000	34,219,887	35,419,887	100,000,000	1,331,949	3.9
2020	24,005,000	43,517,175	67,522,175	100,000,000	1,499,028	1.5
2021	27,185,000	41,618,971	68,803,971	100,000,000	1,581,995	1.5
2022	26,440,000	40,049,272	66,489,272	100,000,000	1,530,833	1.5
2023	22,310,000	38,727,272	61,037,272	100,000,000	1,367,635	1.7
2024	31,030,000	38,763,050	69,793,050	100,000,000	1,639,755	1.5
2025	29,415,000	37,211,550	66,626,550	100,000,000	1,590,773	1.5
2026	31,070,000	35,740,800	66,810,800	100,000,000	1,618,031	1.5
2027	32,795,000	34,187,300	66,982,300	100,000,000	1,645,982	1.5
2028	30,890,000	32,567,550	63,457,550	100,000,000	1,551,809	1.6
2029	30,445,000	31,043,650	61,488,650	100,000,000	1,508,042	1.7
2030	33,310,000	29,521,400	62,831,400	100,000,000	0	1.6
2031	35,500,000	27,781,500	63,281,500	100,000,000	0	1.6
2032	37,010,000	25,969,000	62,979,000	100,000,000	0	1.6
2033	38,610,000	24,081,000	62,691,000	100,000,000	0	1.6
2034	41,150,000	22,098,000	63,248,000	100,000,000	0	1.6
2035	41,865,000	19,983,000	61,848,000	100,000,000	0	1.6
2036	50,260,000	17,842,250	68,102,250	100,000,000	0	1.5
2037	55,585,000	15,116,750	70,701,750	100,000,000	0	1.4
2038	105,000,000	12,100,000	117,100,000	125,000,000	0	1.1
2039	115,000,000	6,325,000	121,325,000	125,000,000	0	1.0



Adjusted Gross Savings

FY	Subordinate Debt Service Prior to Refunding	Subordinate Debt Service After Refunding	Difference
2019	34,993,242	34,087,937	905,304
2020	66,030,814	66,023,147	7,667
2021	67,228,643	67,221,976	6,667
2022	64,966,356	64,958,439	7,917
2023	59,678,555	59,669,637	8,917
2024	68,156,934	68,153,295	3,639
2025	65,038,417	65,035,777	2,639
2026	65,197,159	65,192,769	4,389
2027	65,340,208	65,336,318	3,889
2028	61,907,130	61,905,741	1,389
2029	59,982,747	59,980,608	2,139
2030	65,476,003	62,831,400	2,644,603
2031	66,369,122	63,281,500	3,087,622
2032	66,055,784	62,979,000	3,076,784
2033	65,570,820	62,691,000	2,879,820
2034	66,050,557	63,248,000	2,802,557
2035	64,761,033	61,848,000	2,913,033
2036	68,994,506	68,102,250	892,256
2037	71,303,412	70,701,750	601,662
2038	110,515,360	117,100,000	-6,584,640
2039	114,228,120	121,325,000	-7,096,880

1,437,844,921 1,431,673,545 6,171,376

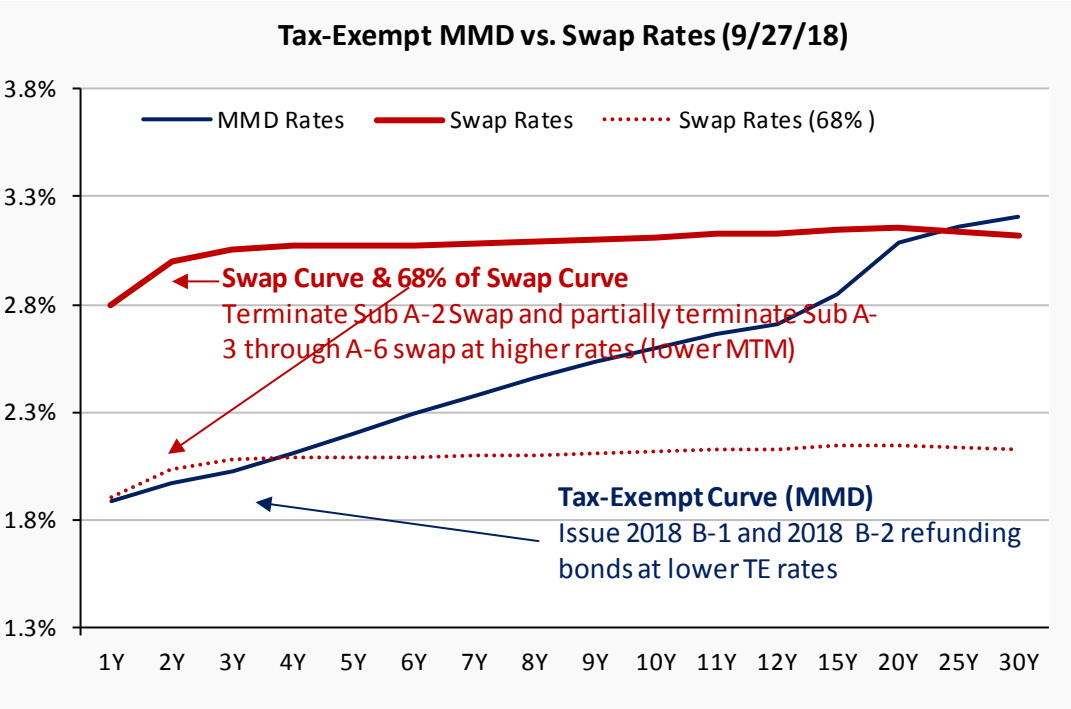
1 Includes estimated liquidity and remarketing costs of 0.75% for Senior and Subordinate variable rate bonds. Debt service is net of the Debt Service Fund Forward Delivery Agreement, assumed Debt Service Reserve Fund earnings of 1.50% and corpus releases.

2 Includes \$9.04 million of funds on hand in the debt service fund + \$27.632 million released from the Basis Reserve Fund.

Refunding Economics Driven by Tax-Exempt vs. LIBOR Rates

- MMD rates drive the benchmark fixed interest rate on the refunding bonds and LIBOR swap rates drive the cost on the swap termination and suspension
- Under current market conditions, the most efficient part of the curve is inside of 5-years

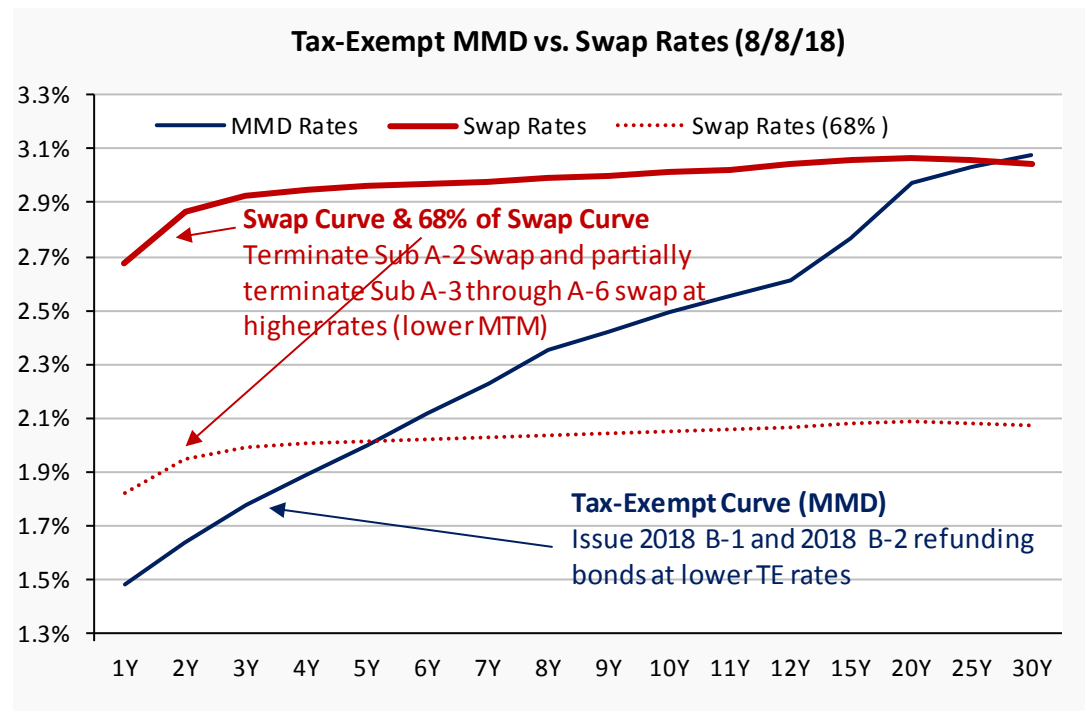
Tax Exempt MMD vs. Swap Rates (9/27/18)			
Tenor	MMD Rates	Swap Rates	Swap Rates (68%)
1Y	1.890%	2.800%	1.904%
2Y	1.970%	2.996%	2.037%
3Y	2.030%	3.055%	2.078%
4Y	2.110%	3.069%	2.087%
5Y	2.200%	3.072%	2.089%
6Y	2.290%	3.077%	2.092%
7Y	2.380%	3.084%	2.097%
8Y	2.460%	3.093%	2.103%
9Y	2.530%	3.103%	2.110%
10Y	2.600%	3.114%	2.118%
11Y	2.660%	3.127%	2.126%
12Y	2.710%	3.133%	2.130%
15Y	2.850%	3.149%	2.141%
20Y	3.090%	3.153%	2.144%
25Y	3.160%	3.139%	2.135%
30Y	3.210%	3.121%	2.122%



Refunding Economics Driven by Tax-Exempt vs. LIBOR Rates

- Market conditions have deteriorated slightly since the Sept. 17th Board meeting
- Below is the Tax-Exempt MMD curve vs. the Swap curve on 8/8/2018, which was included in the presentation at the Sept. 17th Board meeting

Tax Exempt MMD vs. Swap Rates (8/8/18)			
Tenor	MMD Rates	Swap Rates	Swap Rates (68%)
1Y	1.480%	2.676%	1.820%
2Y	1.640%	2.867%	1.950%
3Y	1.780%	2.929%	1.992%
4Y	1.890%	2.950%	2.006%
5Y	2.000%	2.960%	2.013%
6Y	2.120%	2.970%	2.019%
7Y	2.230%	2.979%	2.026%
8Y	2.350%	2.991%	2.034%
9Y	2.420%	3.002%	2.042%
10Y	2.490%	3.017%	2.051%
11Y	2.550%	3.025%	2.057%
12Y	2.610%	3.040%	2.067%
15Y	2.770%	3.058%	2.079%
20Y	2.970%	3.067%	2.086%
25Y	3.030%	3.057%	2.079%
30Y	3.080%	3.044%	2.070%



Overview of Soft Put Bonds

- Soft put bonds are long-term bonds mirroring the maturities of the VRDBs with a nearer term “put date”
- Soft put bonds pay a fixed rate through the put date (4 years as structured herein) and then the bonds are remarketed back into variable rate mode or refinanced
 - The bonds are considered variable rate bonds as the interest rate is undetermined from the put date until final maturity
 - The documents will provide that the bonds can be remarketed into multiple modes (weekly, monthly, etc.)
 - On the soft put date MassDOT can establish a letter of credit or standby bond purchase agreement and remarket the bonds back into weekly variable rate mode (as is currently the case) when the swap reactivates
 - There is a 6-month call feature so MassDOT can begin to remarket or refinance the bonds well in advance of the put date
- By utilizing a “soft” put, bond owners do not have the ability to put the bond back to MassDOT forcing principal payments prior to final maturity in the event of a failed remarketing or refinancing

Overview of Soft Put Bonds

- Upon a failed remarketing or refinancing (e.g., there is no access to the market for any reason), penalty rates would apply (as is currently the case), though the penalty rates are different from the existing VRDBs
 - Soft put example: upon a failed remarketing of 1-90 Days = 70% 1ML + 2.50%; 91-180 Days = Greater of: i) 70% 1ML + 5.00%; or ii) 7.50%; thereafter Maximum Rate (10%)
 - Penalty rates based on current rates:
 - 1-90 days = 4.095%
 - 91-180 days = 7.500%
 - 181 days + = 10.000%
 - Current VRDB example (from Sub A-4 and A-5): after 90 days of failed facility renewal/replacement, **principal paid quarterly over 3-year term plus interest** paid at the higher of (i) the Prime Rate in effect at such time plus one percent (1.0%), (ii) the Federal Funds Rate in effect at such time plus three percent (3.0%), (iii) the LIBOR Rate in effect at such time plus five percent (5.0%) and (iv) seven and one half of one percent (7.5%)
 - Penalty rate based on current rates = 7.5%
 - **Potential max penalty rates/terms apply to both structures if a liquidity/credit facility cannot be renewed or replaced upon expiration (VRDBs) or if a facility cannot be established on put date (soft put bonds)**
 - Max rate in soft put structure = 10%, no principal acceleration
 - Max rate in VRDB structure = 20% + principal accelerated over 3- or 5-year term

Existing VRDBs vs. Soft Put Bonds - Key Risk Comparison

Material Risks	Description of Risk	Existing VRDBs \$371.380 million par amount 2010 Series A 3, A 4, A 5, A 6	Soft Put Bonds \$371.380 million par amount 2018 Series B 2	Risk Impact
Key Risk Profile				
Remarketing Risk	Possibility that the bonds cannot be remarketed	➤ Risk currently exists, each of the four VRDBs are remarketed weekly	➤ Eliminated through put date, similar thereafter	Positive through put date Neutral after put date
Renewal, replacement or new LOC/SBPA Facility Risk	Possibility that a liquidity facility (Standby Bond Purchase Agreement) or credit facility (Letter of Credit) cannot be renewed or entered into	➤ LOC/SBPA facilities would have to be renewed or replaced when they expire ➤ Two series expire in 2019 and two in 2020	➤ A new LOC/SBPA would need to be entered into on soft put date of 1/1/2023 ➤ LOC/SBPA facility can be entered into anytime 6 months prior to put date	<u>Existing VRDBs</u> - two series, half of the \$371.38mm portfolio, remarketed on two dates (more frequent, smaller amounts) <u>Soft put bonds</u> - one series, full \$371.38mm, remarketed on a single date (less frequent, larger amount)
Refinancing Risk	Possibility that the bonds cannot be refinanced with refunding bonds	➤ Risk currently exists	➤ Similar risk	Positive through put date Neutral after put date
Economic Risk Profile				
Failed remarketing	A market or other event prohibiting MassDOT from renewing, replacing or entering into a new LOC or SBPA	➤ Penalty rates apply ➤ Principal repayment is accelerated over 3- or 5-year term	➤ Penalty rates apply ➤ Principal is not required to be paid prior to scheduled maturity	Penalty rate on existing VRDBs could be lower or higher than soft put bonds based on formulas VRDBs require accelerated principal repayment prior to maturity, soft put bonds do not
Failure to refinance	A market or other event prohibiting MassDOT from issuing refunding bonds	➤ Similar to failed remarketing	➤ Similar to failed remarketing	VRDB Max Rate=20% Soft put bond Max Rate=10%

Principal repayment accelerated over 3- or 5 years

Principal not required to be paid

Overview of Novation

- A swap novation means an existing interest swap is moved from the existing counterparty to one or more new counterparties
- As a part of the suspension of the Subordinated A-3 through A-6 Swap, UBS would require that the remaining portion of the swap, reactivated on the soft put date, be novated to a new counterparty
 - UBS is no longer an active swap counterparty in the municipal derivative sector and over the last several years has expressed interest in novating the swaps
- Under a request for responses conducted in October 2017, MassDOT gathered terms, pricing and interest from banks within MassDOT's underwriter pool and received several responses
- We refreshed responses from the banks that expressed interest in their 2017 RFR responses, including terms and pricing, and received several responses
- Novating the Subordinated A-3 through A-6 Swap offers MassDOT the opportunity to improve certain terms on the swap, receive the economics of the refunding transaction and diversify counterparty exposure

Disclosure Requirements

- The 2018 B Refunding Bonds are being issued as Subordinated Bonds under the Trust Agreement
- Contract Assistance Payments received under the 2009 Contract constitute “Dedicated Payments” under the Trust Agreement and are deposited directly to the Subordinated Debt Service Fund
 - On June 30, 2009, the Turnpike Authority and the Commonwealth entered into a Contract for Financial Assistance (the “2009 Contract”) that obligates the Commonwealth to pay MassDOT \$100 million per fiscal year
 - The obligation of the Commonwealth to make such payments to MassDOT constitutes a general obligation of the Commonwealth for which the full faith and credit of the Commonwealth are pledged
- The 2009 Contract Assistance Payments cover 100% of the debt service on all outstanding Subordinated Obligations, including the 2018 B Refunding Bonds
- Since the repayment source is solely from the 2009 Contract Assistance Payments, not revenues of MassDOT:
 - Ratings on the 2018B Refunding Bonds are based on the Commonwealth’s General Obligation credit
 - The Commonwealth’s most current Information Statement is incorporated by reference into the POS
 - The POS informs prospective purchasers that no financial or operating information about MassDOT is included in the POS because the Dedicated Payments pledged as security for the 2018 B Refunding Bonds are anticipated to exceed the total amount of debt service on Subordinated Obligations, including the 2018 B Refunding Bonds, in each year that the 2018 B Refunding Bonds are outstanding

Metropolitan Highway System Outstanding Debt

Outstanding Debt as of 10/1/2018								
Series	Indenture & Lien	Base CUSIP	Type	Avg Coup	Final Maturity	Ratings M/S/F	Amount Issued	Outstanding
Metropolitan Highway System (Senior)								
1997 Series A CABs	MHS SR	576018	Fixed	5.62%	1/1/29	A3/A+ /A+	\$ 42,006,617	\$ 42,006,617
1997 Series C CABs	MHS SR	576018	Fixed	5.49%	1/1/23	A3/A+ /A+	89,136,006	51,286,175
2010 Series A	MHS SR	57563C	Variable	VR	1/1/37	Various	207,665,000	207,665,000
2010 Series B	MHS SR	57563C	Fixed	4.98%	1/1/37	A3/A+/A+	882,310,000	632,060,000
Subtotal							\$1,221,117,623	\$ 933,017,792
Metropolitan Highway System (Subordinated)								
2010 Series A	MHS SUB	57563C	Variable	VR	1/1/39	Various	454,480,000	454,480,000
2010 Series B	MHS SUB	57563C	Fixed	4.98%	1/1/35	Aa2/AA/AA+	261,220,000	261,220,000
2018 Series A	MHS SUB	57563C	Fixed	5.00%	1/1/29	Aa2/AA/AA+	135,690,000	135,690,000
Subtotal							\$ 851,390,000	\$ 851,390,000
Total							\$2,072,507,623	\$1,784,407,792