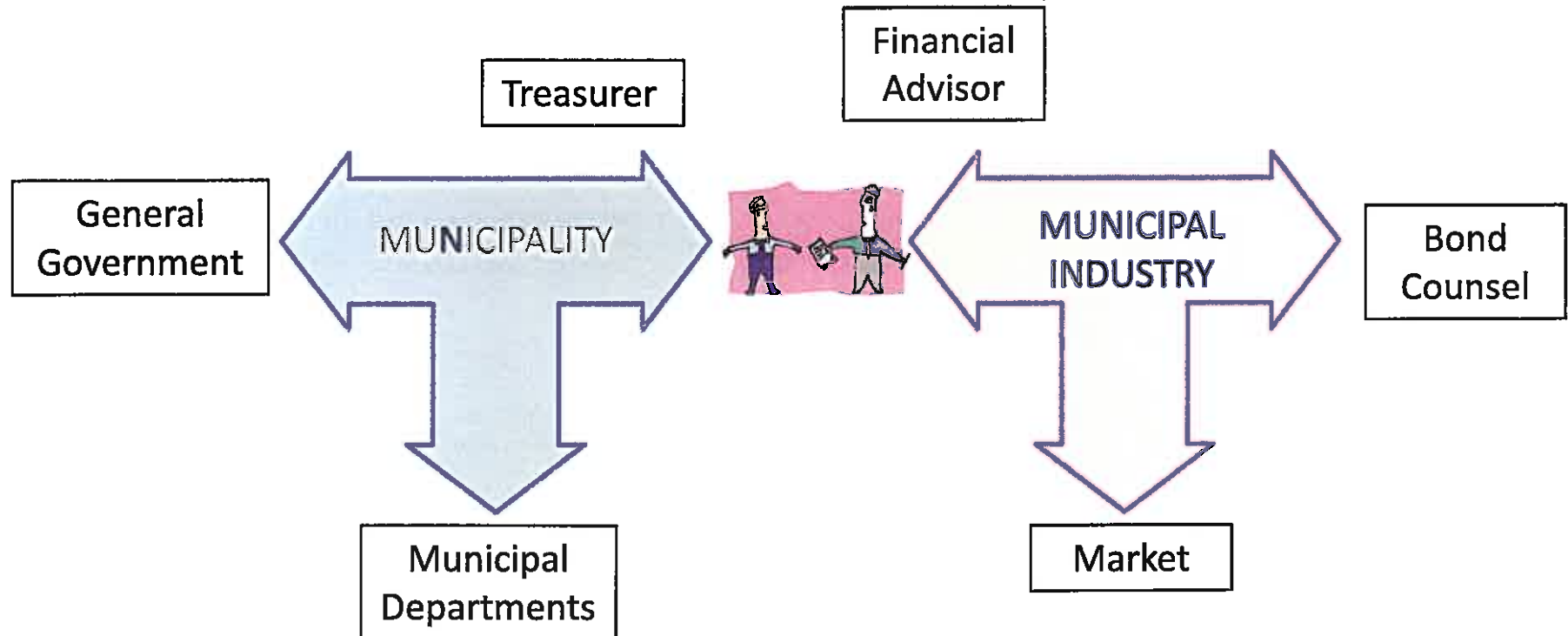


**Association of Town Finance Committees
Annual Meeting, October 21, 2017**

Workshop: Managing Your Town's Credit and Bond Rating

Learn the basics and complexity of how bond ratings work these days, what's at stake, and how to think about financing options and debt policy, from the finance committee perspective.

BONDING RESPONSIBILITIES CHART

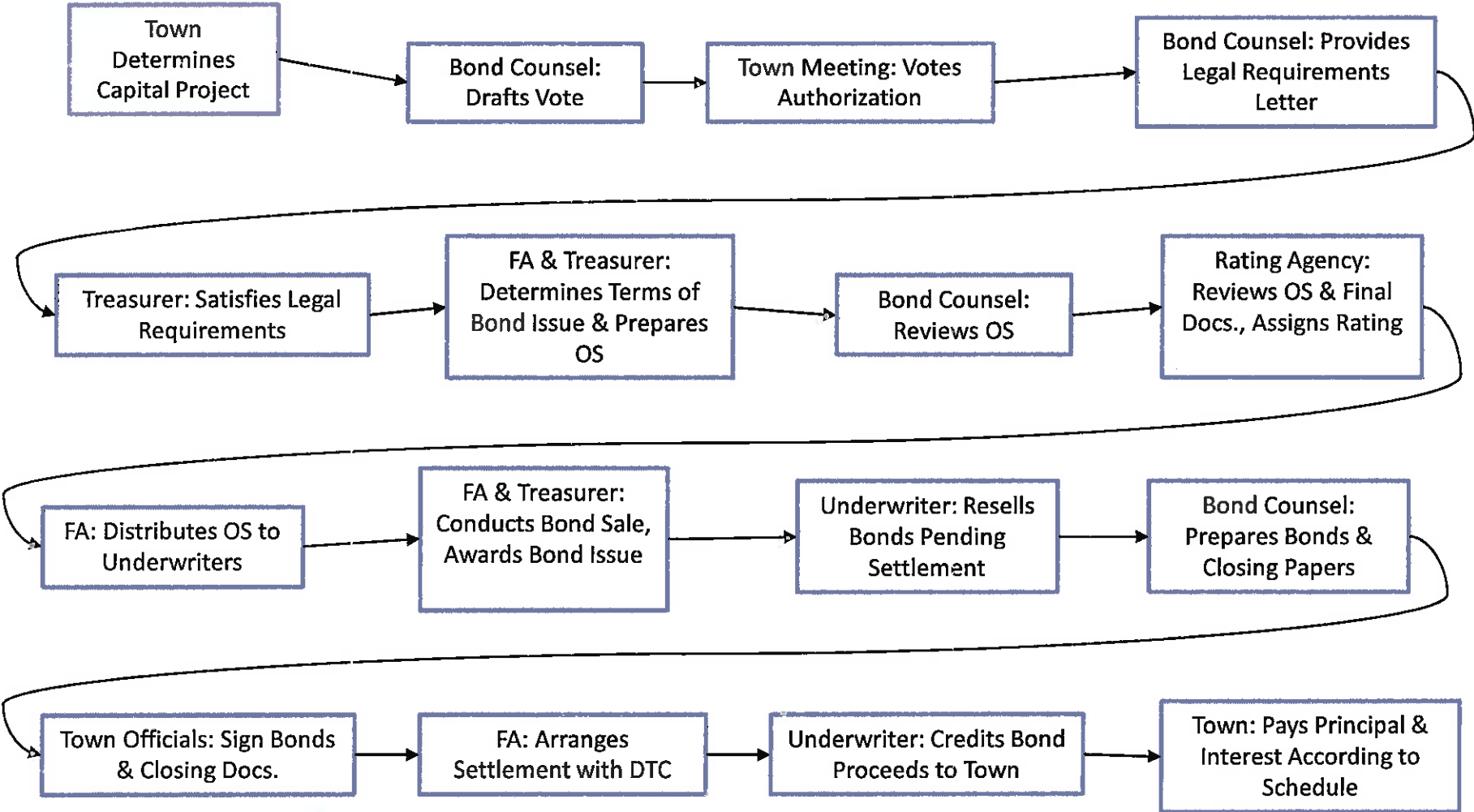


- Department of Revenue
- Department of Education
- Municipal Finance Oversight Board
- State Revolving Fund/MA Clean Water Trust
- Department of Environmental Protection
- MWRA


Other Participants:

- Credit Rating Agencies
- Bond Insurance Companies

Municipal Borrowing Flow Chart



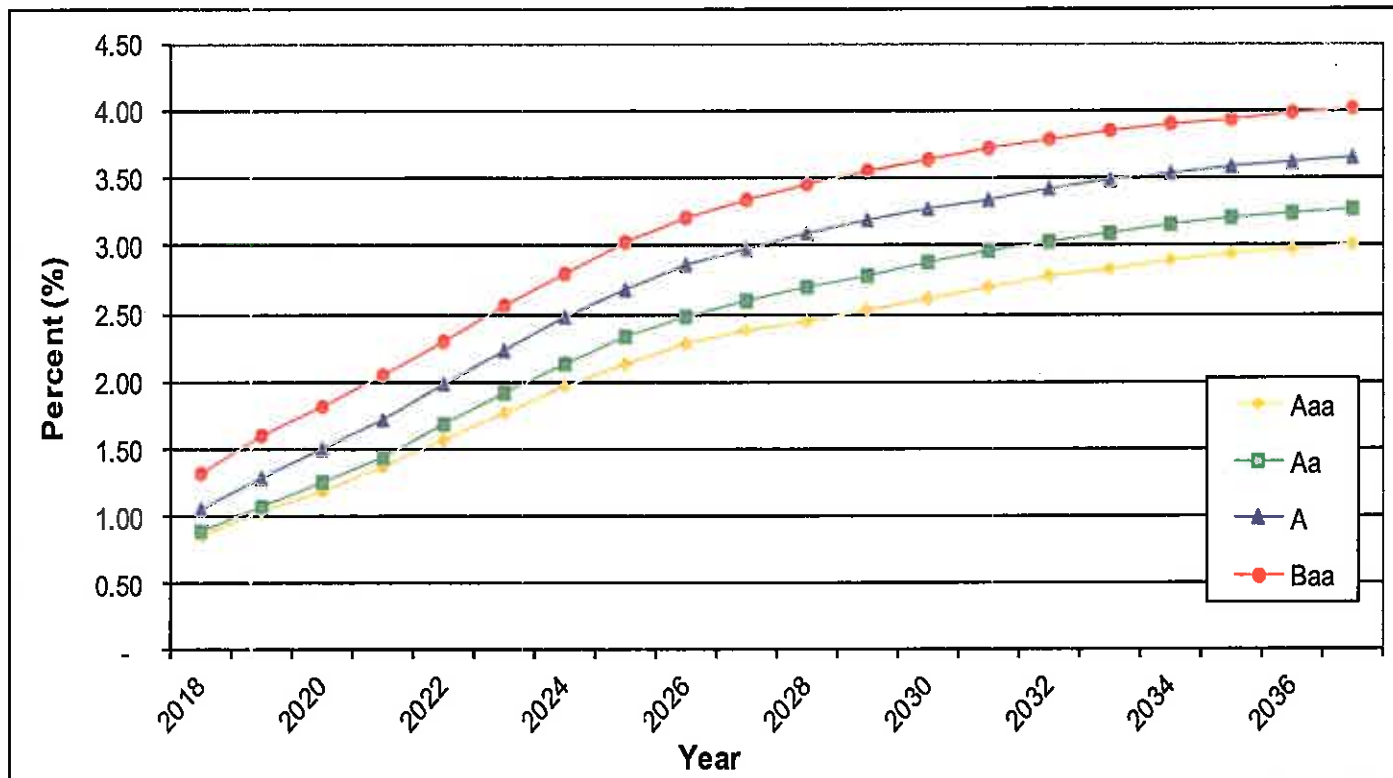
Bond Ratings

<u>Moody's</u>		<u>Standard & Poor's</u>
Aaa		AAA
Aa1		AA+
Aa2		AA
Aa3		AA-
A1		A+
A2		A
A3		A-
Baa1		BBB+
Baa2		BBB
Baa3		BBB-

Credit Spreads

Yield Curves by Rating Comparison

- Higher the rating, more secure an investment = lesser return on investment; borrow at a lower rate
- Lower the rating, more speculative investment = greater risk, borrow at a higher rate



Source: Municipal Market Data, as of February 17, 2017.

Bond Ratings - Unbiased, Expert Assessment of Community's Wellbeing

ECONOMY

- Global, National, Regional and Local
- Tax Base – size, composition, growth
- Employment
- Demographics – wealth & income
- Home values, Building permits

DEBT

- Amount and amortization of existing debt
- Source of Revenue
 - Exempt from Proposition 2 ½
 - Enterprise supported
 - Tax Supported (within the Levy Limit)
- Future debt
- Pension and OPEB unfunded liabilities:
 - Plan in place to address

MANAGEMENT

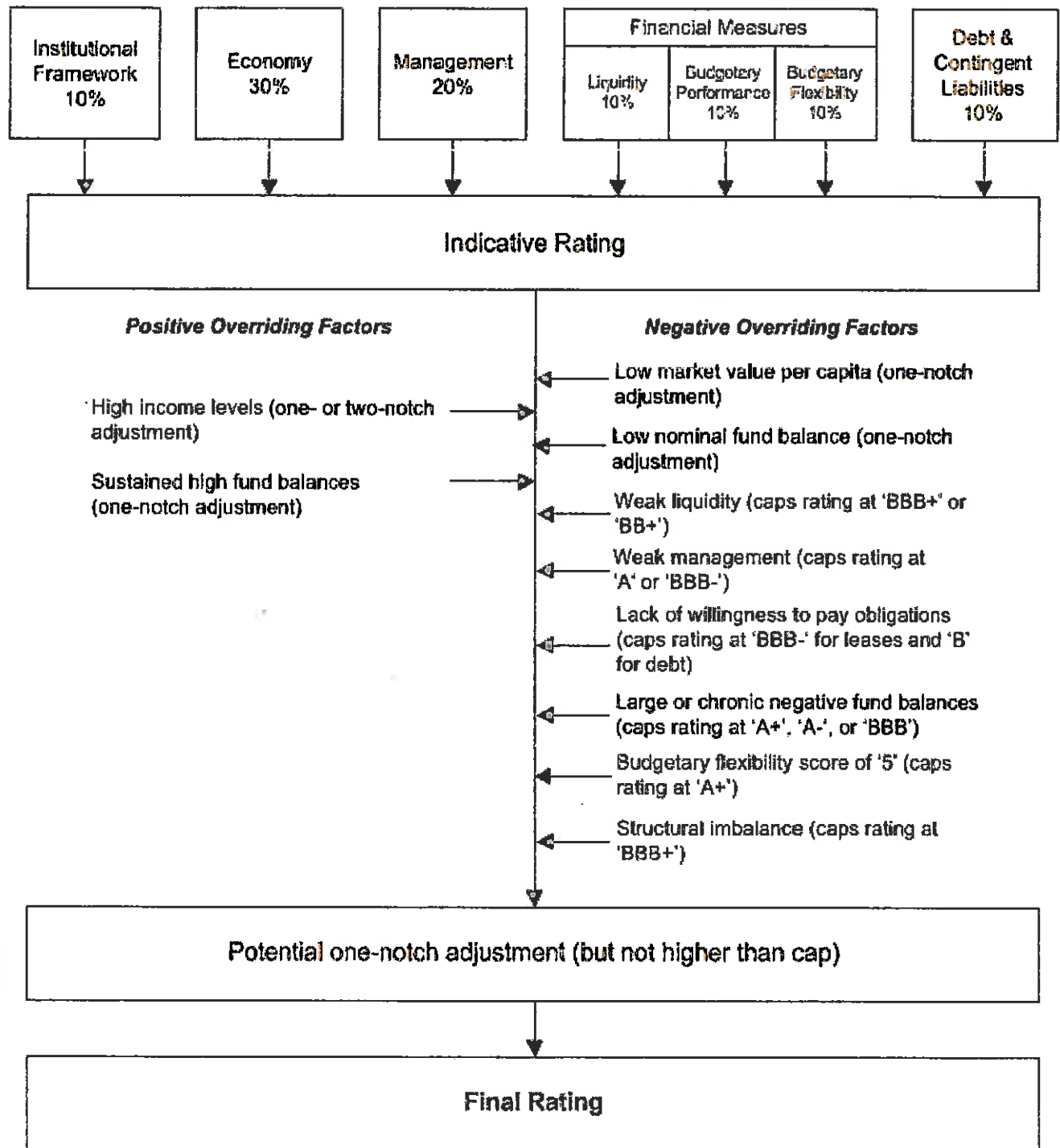
- Policies (Debt, Investment, Reserve, etc.)
- Formalized?
- Budget Amendments and Updates
- Long term financial planning
- Long term capital planning

FINANCES

- Amount and type of reserves (as % of revenue)
 - Unassigned General Fund Balance
 - Stabilization Fund
- Structural Balance
 - Reserve position trend
 - Recurring revenues vs recurring expenditures

Chart 1

Analytical Framework For Local GO Ratings



© Standard & Poor's 2013.

Moody's G.O. Scorecard

Factor 1	Sub-factor	Very Strong Aaa	Strong Aa	Moderate A	Weak Baa	Poor Ba	Very Poor B & Below	Weight
Economy & Tax Base (30%)	Tax Base Size: Full Value	> \$125	\$125 ≥ n > \$1.4B	\$1.4B ≥ n > \$240M	\$240M ≥ n > \$120M	\$120M ≥ n > \$30M	≤ \$30M	10%
	Full Value Per Capite	> \$150,000	\$150,000 ≥ n > \$65,000	\$65,000 ≥ n > \$35,000	\$35,000 ≥ n > \$20,000	\$20,000 ≥ n > \$10,000	≤ \$10,000	10%
	Socioeconomic Indices: MFI	> 150% of US median	150% to 90% of US median	90% to 75% of US median	75% to 50% of US median	50% to 40% of US median	≤ 40% of US median	10%
Factor 2	Sub-factor	Aaa	Aa	A	Baa	Ba	B & Below	Weight
Finances (30%)	Fund Balance as a % of Revenues	> 30%	30.0% ≥ n > 15.0%	15.0% ≥ n > 5.0%	5.0% ≥ n > 0.0%	0.0% ≥ n > -2.5%	≤ -2.5%	10%
	5-Year Dollar Change in Fund Balance as % of Revenues	> 25% for School Districts	25% ≥ n > 10% for SD	10.0% ≥ n > 2.5% for SD	2.5% ≥ n > 0.0% for SD	0.0% ≥ n > -2.5% for SD	≤ -2.5% for SD	5%
	Cash Balance as a % of Revenues	> 25%	25.0% ≥ n > 10.0%	10.0% ≥ n > 5.0%	5.0% ≥ n > 0.0%	0.0% ≥ n > -2.5%	≤ -2.5%	10%
	5-Year Dollar Change in Cash Balance as % of Revenues	> 10% for School Districts	10.0% ≥ n > 5.0% for SD	5.0% ≥ n > 2.5% for SD	2.5% ≥ n > 0.0% for SD	0.0% ≥ n > -2.5% for SD	≤ -2.5% for SD	5%
Factor 3	Sub-factor	Aaa	Aa	A	Baa	Ba	B & Below	Weight
Management (20%)	Institutional Framework	Very strong legal ability to match resources with spending	Strong legal ability to match resources with spending	Moderate legal ability to match resources with spending	Limited legal ability to match resources with spending	Poor legal ability to match resources with spending	Very poor legal ability to match resources with spending	10%
	Operating History: 5-Year Average of Operating Revenues / Operating Expenditures	> 1.05x	1.05x ≥ n > 1.02x	1.02x ≥ n > 0.98x	0.98x ≥ n > 0.95x	0.95x ≥ n > 0.92x	≤ 0.92x	10%
Factor 4	Sub-factor	Aaa	Aa	A	Baa	Ba	B & Below	Weight
Debt/Pensions (20%)	Direct Debt / Full Value	< 0.75%	0.75% ≤ n < 1.75%	1.75% ≤ n < 4.00%	4.00% ≤ n < 10.00%	10.00% ≤ n < 15.00%	> 15.00%	5%
	Direct Debt / Operating Revenues	< 0.33x	0.33x ≤ n < 0.67x	0.67x ≤ n < 3.00x	3.00x ≤ n < 6.00x	5.00x ≤ n < 7.00x	> 7.00x	5%
	3-Year Average of Moody's Adjusted Net Pension Liability / Full Value	< 0.90%	0.90% ≤ n < 2.10%	2.10% ≤ n < 4.80%	4.80% ≤ n < 12.00%	12.00% ≤ n < 18.00%	> 18.00%	5%
	3-Year Average of Moody's Adjusted Net Pension Liability / Operating Revenues	< 0.40x	0.40x ≤ n < 0.80x	0.80x ≤ n < 1.60x	3.60x ≤ n < 6.00x	6.00x ≤ n < 8.40x	> 8.40x	5%

\$15,000,000 General Obligation Bonds
 Dated January 15, 2011
 EQUAL PRINCIPAL

\$15,000,000 General Obligation Bonds
 Dated January 15, 2011
 LEVEL DEBT

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
1/15/2011	-	-	-	-	-
7/15/2011	-	-	257,625.00	257,625.00	-
1/15/2012	750,000.00	2.00%	257,625.00	1,007,625.00	-
6/30/2012	-	-	-	-	1,265,250.00
7/15/2012	-	-	250,125.00	250,125.00	-
1/15/2013	750,000.00	3.00%	250,125.00	1,000,125.00	-
6/30/2013	-	-	-	-	1,250,250.00
7/15/2013	-	-	238,875.00	238,875.00	-
1/15/2014	750,000.00	3.00%	238,875.00	988,875.00	-
6/30/2014	-	-	-	-	1,227,750.00
7/15/2014	-	-	227,625.00	227,625.00	-
1/15/2015	750,000.00	3.00%	227,625.00	977,625.00	-
6/30/2015	-	-	-	-	1,205,250.00
7/15/2015	-	-	216,375.00	216,375.00	-
1/15/2016	750,000.00	3.00%	216,375.00	966,375.00	-
6/30/2016	-	-	-	-	1,182,750.00
7/15/2016	-	-	205,125.00	205,125.00	-
1/15/2017	750,000.00	4.00%	205,125.00	955,125.00	-
6/30/2017	-	-	-	-	1,160,250.00
7/15/2017	-	-	190,125.00	190,125.00	-
1/15/2018	750,000.00	4.00%	190,125.00	940,125.00	-
6/30/2018	-	-	-	-	1,130,250.00
7/15/2018	-	-	175,125.00	175,125.00	-
1/15/2019	750,000.00	4.00%	175,125.00	925,125.00	-
6/30/2019	-	-	-	-	1,100,250.00
7/15/2019	-	-	160,125.00	160,125.00	-
1/15/2020	750,000.00	4.00%	160,125.00	910,125.00	-
6/30/2020	-	-	-	-	1,070,250.00
7/15/2020	-	-	145,125.00	145,125.00	-
1/15/2021	750,000.00	4.00%	145,125.00	895,125.00	-
6/30/2021	-	-	-	-	1,040,250.00
7/15/2021	-	-	130,125.00	130,125.00	-
1/15/2022	750,000.00	4.00%	130,125.00	880,125.00	-
6/30/2022	-	-	-	-	1,010,250.00
7/15/2022	-	-	115,125.00	115,125.00	-
1/15/2023	750,000.00	4.25%	115,125.00	865,125.00	-
6/30/2023	-	-	-	-	980,250.00
7/15/2023	-	-	99,187.50	99,187.50	-
1/15/2024	750,000.00	4.00%	99,187.50	849,187.50	-
6/30/2024	-	-	-	-	948,375.00
7/15/2024	-	-	84,187.50	84,187.50	-
1/15/2025	750,000.00	3.00%	84,187.50	834,187.50	-
6/30/2025	-	-	-	-	918,375.00
7/15/2025	-	-	72,937.50	72,937.50	-
1/15/2026	750,000.00	3.00%	72,937.50	822,937.50	-
6/30/2026	-	-	-	-	895,875.00
7/15/2026	-	-	61,687.50	61,687.50	-
1/15/2027	750,000.00	3.10%	61,687.50	811,687.50	-
6/30/2027	-	-	-	-	873,375.00
7/15/2027	-	-	50,062.50	50,062.50	-
1/15/2028	750,000.00	3.15%	50,062.50	800,062.50	-
6/30/2028	-	-	-	-	850,125.00
7/15/2028	-	-	38,250.00	38,250.00	-
1/15/2029	750,000.00	3.25%	38,250.00	788,250.00	-
6/30/2029	-	-	-	-	826,500.00
7/15/2029	-	-	26,062.50	26,062.50	-
1/15/2030	750,000.00	3.45%	26,062.50	776,062.50	-
6/30/2030	-	-	-	-	802,125.00
7/15/2030	-	-	13,125.00	13,125.00	-
1/15/2031	750,000.00	3.50%	13,125.00	763,125.00	-
6/30/2031	-	-	-	-	776,250.00
Total	\$ 15,000,000.00		\$ 5,514,800.00	\$ 20,514,800.00	

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
1/15/2011	-	-	-	-	-
7/15/2011	-	-	258,801.25	258,801.25	-
1/15/2012	535,000.00	2.00%	258,801.25	793,801.25	-
6/30/2012	-	-	-	-	1,052,602.50
7/15/2012	-	-	253,451.25	253,451.25	-
1/15/2013	645,000.00	3.00%	253,451.25	798,451.25	-
6/30/2013	-	-	-	-	1,051,902.50
7/15/2013	-	-	245,276.25	245,276.25	-
1/15/2014	585,000.00	3.00%	245,276.25	810,276.25	-
6/30/2014	-	-	-	-	1,055,552.50
7/15/2014	-	-	236,801.25	236,801.25	-
1/15/2015	580,000.00	3.00%	236,801.25	816,801.25	-
6/30/2015	-	-	-	-	1,053,602.50
7/15/2015	-	-	228,101.25	228,101.25	-
1/15/2016	600,000.00	3.00%	228,101.25	828,101.25	-
6/30/2016	-	-	-	-	1,056,202.50
7/15/2016	-	-	219,101.25	219,101.25	-
1/15/2017	615,000.00	4.00%	219,101.25	834,101.25	-
6/30/2017	-	-	-	-	1,053,202.50
7/15/2017	-	-	208,801.25	208,801.25	-
1/15/2018	640,000.00	4.00%	208,801.25	846,801.25	-
6/30/2018	-	-	-	-	1,053,802.50
7/15/2018	-	-	194,001.25	194,001.25	-
1/15/2019	665,000.00	4.00%	194,001.25	859,001.25	-
6/30/2019	-	-	-	-	1,053,002.50
7/15/2019	-	-	180,701.25	180,701.25	-
1/15/2020	695,000.00	4.00%	180,701.25	875,701.25	-
6/30/2020	-	-	-	-	1,056,402.50
7/15/2020	-	-	166,801.25	166,801.25	-
1/15/2021	720,000.00	4.00%	166,801.25	886,801.25	-
6/30/2021	-	-	-	-	1,053,602.50
7/15/2021	-	-	152,401.25	152,401.25	-
1/15/2022	750,000.00	4.00%	152,401.25	902,401.25	-
6/30/2022	-	-	-	-	1,054,802.50
7/15/2022	-	-	137,401.25	137,401.25	-
1/15/2023	780,000.00	4.25%	137,401.25	917,401.25	-
6/30/2023	-	-	-	-	1,054,802.50
7/15/2023	-	-	120,826.25	120,826.25	-
1/15/2024	815,000.00	4.00%	120,826.25	935,826.25	-
6/30/2024	-	-	-	-	1,056,652.50
7/15/2024	-	-	104,526.25	104,526.25	-
1/15/2025	845,000.00	3.00%	104,526.25	949,526.25	-
6/30/2025	-	-	-	-	1,054,052.50
7/15/2025	-	-	91,851.25	91,851.25	-
1/15/2026	870,000.00	3.00%	91,851.25	961,851.25	-
6/30/2026	-	-	-	-	1,053,702.50
7/15/2026	-	-	78,801.25	78,801.25	-
1/15/2027	895,000.00	3.10%	78,801.25	973,801.25	-
6/30/2027	-	-	-	-	1,052,602.50
7/15/2027	-	-	64,928.75	64,928.75	-
1/15/2028	925,000.00	3.15%	64,928.75	989,928.75	-
6/30/2028	-	-	-	-	1,054,857.50
7/15/2028	-	-	50,360.00	50,360.00	-
1/15/2029	955,000.00	3.25%	50,360.00	1,005,360.00	-
6/30/2029	-	-	-	-	1,055,720.00
7/15/2029	-	-	34,841.25	34,841.25	-
1/15/2030	985,000.00	3.45%	34,841.25	1,019,841.25	-
6/30/2030	-	-	-	-	1,054,682.50
7/15/2030	-	-	17,850.00	17,850.00	-
1/15/2031	1,020,000.00	3.50%	17,850.00	1,037,850.00	-
6/30/2031	-	-	-	-	1,055,700.00
Total	\$ 15,000,000.00		\$ 6,087,250.00	\$ 21,087,250.00	



\$15,000,000 General Obligation Bonds REDUCED BY PREMIUM
 Dated January 15, 2011
 EQUAL PRINCIPAL

\$15,000,000 General Obligation Bonds REDUCED BY PREMIUM
 Dated January 15, 2011
 LEVEL DEBT

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
1/15/2011	-	-	-	-	-
7/15/2011	-	-	236,558.75	236,558.75	-
1/15/2012	695,000.00	2.00%	833,558.75	833,558.75	-
6/30/2012	-	-	-	-	1,172,117.50
7/15/2012	-	-	231,608.75	231,608.75	-
1/15/2013	695,000.00	3.00%	231,608.75	926,608.75	-
6/30/2013	-	-	-	-	1,158,217.50
7/15/2013	-	-	221,183.75	221,183.75	-
1/15/2014	695,000.00	3.00%	221,183.75	916,183.75	-
6/30/2014	-	-	-	-	1,137,367.50
7/15/2014	-	-	210,758.75	210,758.75	-
1/15/2015	695,000.00	3.00%	210,758.75	905,758.75	-
6/30/2015	-	-	-	-	1,118,517.50
7/15/2015	-	-	200,333.75	200,333.75	-
1/15/2016	695,000.00	3.00%	200,333.75	895,333.75	-
6/30/2016	-	-	-	-	1,095,567.50
7/15/2016	-	-	189,908.75	189,908.75	-
1/15/2017	695,000.00	4.00%	189,908.75	884,908.75	-
6/30/2017	-	-	-	-	1,074,817.50
7/15/2017	-	-	178,008.75	178,008.75	-
1/15/2018	695,000.00	4.00%	178,008.75	871,008.75	-
6/30/2018	-	-	-	-	1,047,017.50
7/15/2018	-	-	162,108.75	162,108.75	-
1/15/2019	695,000.00	4.00%	162,108.75	857,108.75	-
6/30/2019	-	-	-	-	1,019,217.50
7/15/2019	-	-	148,208.75	148,208.75	-
1/15/2020	695,000.00	4.00%	148,208.75	843,208.75	-
6/30/2020	-	-	-	-	961,417.50
7/15/2020	-	-	134,308.75	134,308.75	-
1/15/2021	695,000.00	4.00%	134,308.75	829,308.75	-
6/30/2021	-	-	-	-	963,617.50
7/15/2021	-	-	120,408.75	120,408.75	-
1/15/2022	695,000.00	4.00%	120,408.75	815,408.75	-
6/30/2022	-	-	-	-	935,817.50
7/15/2022	-	-	108,508.75	108,508.75	-
1/15/2023	695,000.00	4.25%	108,508.75	801,508.75	-
6/30/2023	-	-	-	-	908,017.50
7/15/2023	-	-	91,740.00	91,740.00	-
1/15/2024	695,000.00	4.00%	91,740.00	786,740.00	-
6/30/2024	-	-	-	-	878,480.00
7/15/2024	-	-	77,840.00	77,840.00	-
1/15/2025	695,000.00	3.00%	77,840.00	772,840.00	-
6/30/2025	-	-	-	-	850,880.00
7/15/2025	-	-	67,415.00	67,415.00	-
1/15/2026	695,000.00	3.00%	67,415.00	762,415.00	-
6/30/2026	-	-	-	-	829,830.00
7/15/2026	-	-	58,980.00	58,980.00	-
1/15/2027	695,000.00	3.10%	58,980.00	751,980.00	-
6/30/2027	-	-	-	-	808,980.00
7/15/2027	-	-	48,217.50	48,217.50	-
1/15/2028	695,000.00	3.15%	48,217.50	741,217.50	-
6/30/2028	-	-	-	-	787,435.00
7/15/2028	-	-	35,271.25	35,271.25	-
1/15/2029	695,000.00	3.25%	35,271.25	730,271.25	-
6/30/2029	-	-	-	-	765,542.50
7/15/2029	-	-	23,977.50	23,977.50	-
1/15/2030	690,000.00	3.45%	23,977.50	713,977.50	-
6/30/2030	-	-	-	-	737,955.00
7/15/2030	-	-	12,075.00	12,075.00	-
1/15/2031	690,000.00	3.50%	12,075.00	702,075.00	-
6/30/2031	-	-	-	-	714,150.00

Total	\$ 13,890,000.00	\$ 5,102,862.50	\$ 18,992,862.50
			\$ 1,521,137.50 Savings over pg. 7
	+ 1,110,000.00 Premium		
	\$ 15,000,000.00 Project Fund		

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
1/15/2011	-	-	-	-	-
7/15/2011	-	-	240,658.75	240,658.75	-
1/15/2012	500,000.00	2.00%	240,658.75	740,658.75	-
6/30/2012	-	-	-	-	981,317.50
7/15/2012	-	-	235,658.75	235,658.75	-
1/15/2013	510,000.00	3.00%	235,658.75	745,658.75	-
6/30/2013	-	-	-	-	981,317.50
7/15/2013	-	-	228,008.75	228,008.75	-
1/15/2014	525,000.00	3.00%	228,008.75	753,008.75	-
6/30/2014	-	-	-	-	981,017.50
7/15/2014	-	-	220,133.75	220,133.75	-
1/15/2015	540,000.00	3.00%	220,133.75	760,133.75	-
6/30/2015	-	-	-	-	980,287.50
7/15/2015	-	-	212,033.75	212,033.75	-
1/15/2016	555,000.00	3.00%	212,033.75	767,033.75	-
6/30/2016	-	-	-	-	979,067.50
7/15/2016	-	-	203,708.75	203,708.75	-
1/15/2017	575,000.00	4.00%	203,708.75	778,708.75	-
6/30/2017	-	-	-	-	982,417.50
7/15/2017	-	-	192,208.75	192,208.75	-
1/15/2018	595,000.00	4.00%	192,208.75	787,208.75	-
6/30/2018	-	-	-	-	979,417.50
7/15/2018	-	-	180,308.75	180,308.75	-
1/15/2019	620,000.00	4.00%	180,308.75	800,308.75	-
6/30/2019	-	-	-	-	980,617.50
7/15/2019	-	-	167,908.75	167,908.75	-
1/15/2020	645,000.00	4.00%	167,908.75	812,908.75	-
6/30/2020	-	-	-	-	980,817.50
7/15/2020	-	-	155,008.75	155,008.75	-
1/15/2021	670,000.00	4.00%	155,008.75	825,008.75	-
6/30/2021	-	-	-	-	980,017.50
7/15/2021	-	-	141,608.75	141,608.75	-
1/15/2022	695,000.00	4.00%	141,608.75	838,608.75	-
6/30/2022	-	-	-	-	978,217.50
7/15/2022	-	-	127,708.75	127,708.75	-
1/15/2023	725,000.00	4.25%	127,708.75	852,708.75	-
6/30/2023	-	-	-	-	980,417.50
7/15/2023	-	-	112,302.50	112,302.50	-
1/15/2024	755,000.00	4.00%	112,302.50	867,302.50	-
6/30/2024	-	-	-	-	979,605.00
7/15/2024	-	-	97,202.50	97,202.50	-
1/15/2025	795,000.00	3.00%	97,202.50	892,202.50	-
6/30/2025	-	-	-	-	979,405.00
7/15/2025	-	-	85,427.50	85,427.50	-
1/15/2026	810,000.00	3.00%	85,427.50	895,427.50	-
6/30/2026	-	-	-	-	980,855.00
7/15/2026	-	-	73,277.50	73,277.50	-
1/15/2027	835,000.00	3.10%	73,277.50	908,277.50	-
6/30/2027	-	-	-	-	981,555.00
7/15/2027	-	-	60,335.00	60,335.00	-
1/15/2028	860,000.00	3.15%	60,335.00	920,335.00	-
6/30/2028	-	-	-	-	980,670.00
7/15/2028	-	-	48,790.00	48,790.00	-
1/15/2029	885,000.00	3.25%	48,790.00	931,790.00	-
6/30/2029	-	-	-	-	978,580.00
7/15/2029	-	-	32,408.75	32,408.75	-
1/15/2030	915,000.00	3.45%	32,408.75	947,408.75	-
6/30/2030	-	-	-	-	979,817.50
7/15/2030	-	-	16,625.00	16,625.00	-
1/15/2031	950,000.00	3.50%	16,625.00	966,625.00	-
6/30/2031	-	-	-	-	983,250.00

Total	\$ 13,950,000.00	\$ 5,658,647.50	\$ 19,608,647.50
			\$ 1,478,602.50 Savings over pg. 7
	+ 1,050,000.00 Premium		
	\$ 15,000,000.00 Project Fund		

\$13,890,000 General Obligation Bonds

Dated January 15, 2011

Equal Principal - Reduced by Premium

Pricing Summary

Maturity	Type of Bond	(A) Coupon	(B) Yield	(C) Maturity Value	(D) Price	(E) Dollar Price
01/15/2012	Serial Coupon	2.000%	0.800%	695,000.00	101.192%	703,284.40
01/15/2013	Serial Coupon	3.000%	0.870%	695,000.00	104.214%	724,287.30
01/15/2014	Serial Coupon	3.000%	0.950%	695,000.00	106.049%	737,040.55
01/15/2015	Serial Coupon	3.000%	1.040%	695,000.00	107.659%	748,230.05
01/15/2016	Serial Coupon	3.000%	1.150%	695,000.00	108.964%	757,299.80
01/15/2017	Serial Coupon	4.000%	1.290%	695,000.00	115.598%	803,406.10
01/15/2018	Serial Coupon	4.000%	1.450%	695,000.00	116.915%	812,559.25
01/15/2019	Serial Coupon	4.000%	1.610%	695,000.00	117.872%	819,210.40
01/15/2020	Serial Coupon	4.000%	1.750%	695,000.00	118.660%	824,687.00
01/15/2021	Serial Coupon	4.000%	1.900%	695,000.00	119.043%	827,348.85
01/15/2022	Serial Coupon	4.000%	2.030%	695,000.00	117.748% c	818,348.60
01/15/2023	Serial Coupon	4.250%	2.210%	695,000.00	118.213% c	821,580.35
01/15/2024	Serial Coupon	4.000%	2.350%	695,000.00	114.628% c	796,664.60
01/15/2025	Serial Coupon	3.000%	2.450%	695,000.00	104.851% c	728,714.45
01/15/2026	Serial Coupon	3.000%	2.750%	695,000.00	102.172% c	710,095.40
01/15/2027	Serial Coupon	3.100%	2.850%	695,000.00	102.162% c	710,025.90
01/15/2028	Serial Coupon	3.150%	3.000%	695,000.00	101.287% c	703,944.65
01/15/2029	Serial Coupon	3.250%	3.020%	695,000.00	101.972% c	708,705.40
01/15/2030	Serial Coupon	3.450%	3.040%	690,000.00	103.512% c	714,232.80
01/15/2031	Serial Coupon	3.500%	3.070%	690,000.00	103.678% c	715,378.20
Total	-	-	-	\$13,890,000.00	-	\$15,185,044.05

Bid Information

Par Amount of Bonds.....	\$13,890,000.00
Reoffering Premium or (Discount).....	1,295,044.05
Gross Production.....	\$15,185,044.05
Total Underwriter's Discount (0.600%).....	\$(83,340.00)
Bid (108.724%).....	15,101,704.05
Total Purchase Price.....	\$15,101,704.05
Bond Year Dollars.....	\$145,755.00
Average Life.....	10.494 Years
Average Coupon.....	3.5009862%
Net Interest Cost (NIC).....	2.6696569%
True Interest Cost (TIC).....	2.5221824%

\$13,950,000 General Obligation Bonds

Dated January 15, 2011

Level Debt - Reduced by Premium

Pricing Summary

Maturity	Type of Bond	(A) Coupon	(B) Yield	(C) Maturity Value	(D) Price	(E) Dollar Price
01/15/2012	Serial Coupon	2.000%	0.800%	500,000.00	101.192%	505,960.00
01/15/2013	Serial Coupon	3.000%	0.870%	510,000.00	104.214%	531,491.40
01/15/2014	Serial Coupon	3.000%	0.950%	525,000.00	106.049%	556,757.25
01/15/2015	Serial Coupon	3.000%	1.040%	540,000.00	107.659%	581,358.60
01/15/2016	Serial Coupon	3.000%	1.150%	555,000.00	108.964%	604,750.20
01/15/2017	Serial Coupon	4.000%	1.290%	575,000.00	115.598%	664,688.50
01/15/2018	Serial Coupon	4.000%	1.450%	595,000.00	116.915%	695,644.25
01/15/2019	Serial Coupon	4.000%	1.610%	620,000.00	117.872%	730,806.40
01/15/2020	Serial Coupon	4.000%	1.750%	645,000.00	118.660%	765,357.00
01/15/2021	Serial Coupon	4.000%	1.900%	670,000.00	119.043%	797,588.10
01/15/2022	Serial Coupon	4.000%	2.030%	695,000.00	117.748%	c 818,348.60
01/15/2023	Serial Coupon	4.250%	2.210%	725,000.00	118.213%	c 857,044.25
01/15/2024	Serial Coupon	4.000%	2.350%	755,000.00	114.628%	c 865,441.40
01/15/2025	Serial Coupon	3.000%	2.450%	785,000.00	104.851%	c 823,080.35
01/15/2026	Serial Coupon	3.000%	2.750%	810,000.00	102.172%	c 827,593.20
01/15/2027	Serial Coupon	3.100%	2.850%	835,000.00	102.162%	c 853,052.70
01/15/2028	Serial Coupon	3.150%	3.000%	860,000.00	101.287%	c 871,068.20
01/15/2029	Serial Coupon	3.250%	3.020%	885,000.00	101.972%	c 902,452.20
01/15/2030	Serial Coupon	3.450%	3.040%	915,000.00	103.512%	c 947,134.80
01/15/2031	Serial Coupon	3.500%	3.070%	950,000.00	103.678%	c 984,941.00
Total	-	-	-	\$13,950,000.00	-	\$15,184,558.40

Bid Information

Par Amount of Bonds.....	\$13,950,000.00
Reoffering Premium or (Discount).....	1,234,558.40
Gross Production.....	\$15,184,558.40
Total Underwriter's Discount (0.600%).....	\$(83,700.00)
Bid (108.250%).....	15,100,858.40
Total Purchase Price.....	\$15,100,858.40
Bond Year Dollars.....	\$162,705.00
Average Life.....	11.663 Years
Average Coupon.....	3.4778572%
Net Interest Cost (NIC).....	2.7705289%
True Interest Cost (TIC).....	2.6325911%

Bond/Note Premium Appropriation Language

Provides flexibility for the use of premiums received (not required)

TOWN – Draft Article and Motion*

Article __: To see if the Town will vote to supplement each prior vote of the Town that authorizes the borrowing of money to pay costs of capital projects to provide that, in accordance with Chapter 44, Section 20 of the General Laws, the premium received by the Town upon the sale of any bonds or notes thereunder, less any such premium applied to the payment of the costs of issuance of such bond or notes, may be applied to pay project costs and the amount authorized to be borrowed for each such project shall be reduced by the amount of any such premium so applied.

Motion __: That the Town votes to supplement each prior vote of the Town that authorizes the borrowing of money to pay costs of capital projects to provide that, in accordance with Chapter 44, Section 20 of the General Laws, the premium received by the Town upon the sale of any bonds or notes thereunder, less any such premium applied to the payment of the costs of issuance of such bonds or notes, may be applied to pay project costs and the amount authorized to be borrowed for each such project shall be reduced by the amount of any such premium so applied.

CITY – Draft Order*

That each prior order of the City Council that authorizes the borrowing of money to pay costs of capital projects is hereby supplemented to provide that, in accordance with Chapter 44, Section 20 of the General Laws, as most recently amended by the Municipal Modernization Act, so-called, the premium received by the City upon the sale of any bonds or notes thereunder, less any such premium applied to the payment of the costs of issuance of such bonds or notes, may be applied to pay project costs and the amount authorized to be borrowed for each such project shall be reduced by the amount of any such premium so applied.

*Prepared by Locke Lord LLP

Structuring: Each purpose is structured separately. The aggregate bond structure is the result of the combined individual purposes.

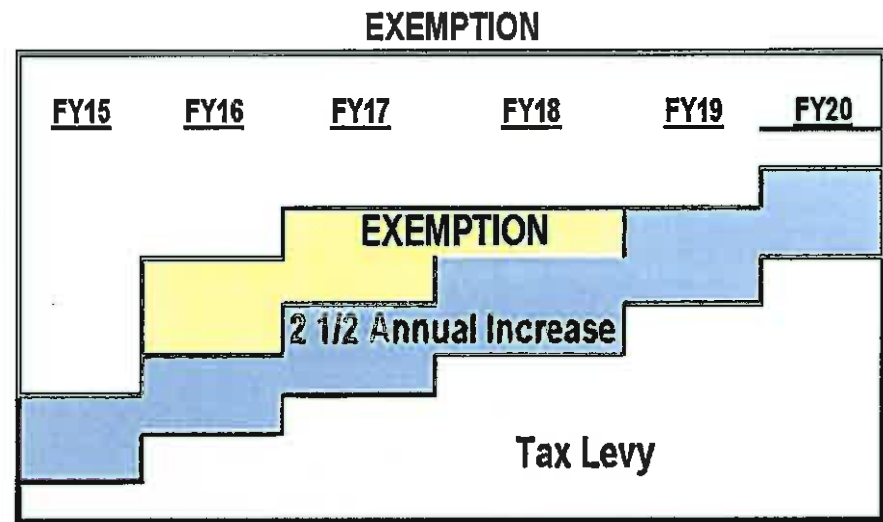
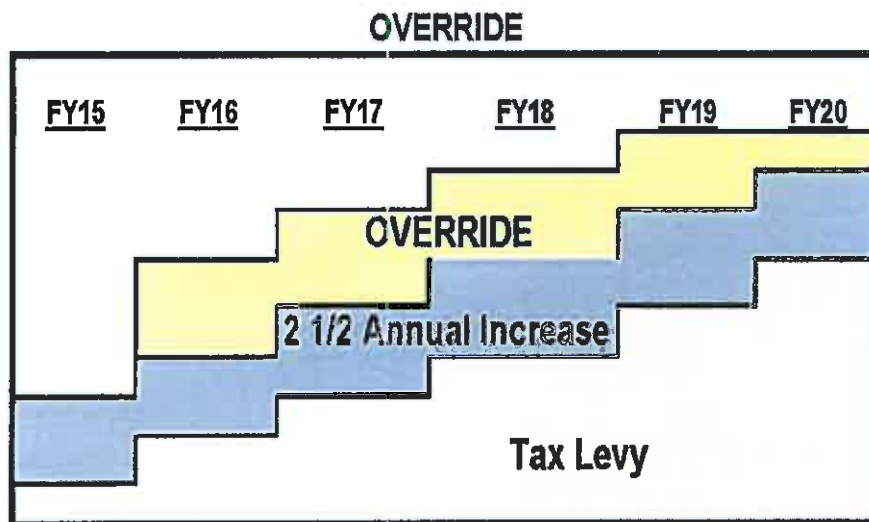
	General		Water	Total Issue
	Communication Console Replacement	Aerial/Ladder Truck (EXEMPT)	Water Mains - Main Street	Total Issue
15-Jun-18	40,000	25,000	50,000	\$ 115,000
15-Jun-19	40,000	30,000	55,000	\$ 125,000
15-Jun-20	40,000	30,000	55,000	\$ 125,000
15-Jun-21	40,000	30,000	55,000	\$ 125,000
15-Jun-22	-	30,000	60,000	\$ 90,000
15-Jun-23	-	35,000	60,000	\$ 95,000
15-Jun-24	-	35,000	65,000	\$ 100,000
15-Jun-25	-	35,000	65,000	\$ 100,000
15-Jun-26	-	35,000	70,000	\$ 105,000
15-Jun-27	-	40,000	70,000	\$ 110,000
15-Jun-28	-	40,000	75,000	\$ 115,000
15-Jun-29	-	40,000	80,000	\$ 120,000
15-Jun-30	-	45,000	80,000	\$ 125,000
15-Jun-31	-	45,000	85,000	\$ 130,000
15-Jun-32	-	45,000	85,000	\$ 130,000
15-Jun-33	-	50,000	90,000	\$ 140,000
15-Jun-34	-	50,000	95,000	\$ 145,000
15-Jun-35	-	55,000	100,000	\$ 155,000
15-Jun-36	-	55,000	100,000	\$ 155,000
15-Jun-37	-	-	105,000	\$ 105,000
Total	\$ 160,000	\$ 750,000	\$ 1,500,000	\$ 2,410,000
Original Issue Date of BANs	6/17/2016	6/17/2016	6/17/2016	
BANs Outstanding	\$160,000	\$750,000	\$1,500,000	\$2,410,000
Reference	7(1)	7(1)	8(5)	
Maximum Term	5	20	40	
Original Auth. Amt	\$160,000	\$750,000	\$1,500,000	
Date of Auth.	4/27/2015	4/25/2016	4/25/2016	
Maximum Maturity	6/17/2021	6/17/2036	6/17/2056	

Proposition 2 1/2

- Proposition 2 ½ places constraints on the amount of property tax levy a community can raise and how much the property tax levy can be increased from year to year.
 - Levy may increase up to 2 ½ percent over the prior years levy.
 - Maximum levy equal to 2 ½ percent of the assessed valuation.
- Additional taxes must be approved by the voters at an election by a majority vote.
 - Override: obtain additional funds for annual operating budgets and fixed costs
 - Exclusion: raise additional taxes to fund capital projects only (annual debt service)
 - Statutory language (Ch. 59, Section 21C) excludes project, not amount

Proposition 2 1/2 (Cont.)

- Override increases the levy limit for the fiscal year voted
 - Becomes part of the base for calculating future years' levy limits.
- Exclusions are temporary property tax increases.



Long Term Structuring

- What to consider when structuring debt?
 1. Legal limits as described in M.G.L. Ch.44, s. 7 & 8
 2. Tax/rate impact of structure
 3. How new debt fits into existing debt
 4. Impact of new debt in future fiscal years
 5. How each purpose will be structured - equal principal versus level debt

Moody's National vs. Massachusetts Medians

Source: Moody's Investors Service, October, 2017

	National Medians						Massachusetts Medians					
	Aa1	Aa2	Aa3	A1	A2	A3	Aa1	Aa2	Aa3	A1	A2	A3
Total GO and Issuer Ratings in Medians	222	636	432	388	141	59	17	50	50	26	5	2
Tax Base												
Total Full Value (\$000)	\$4,558,435	\$2,556,584	\$1,312,223	\$628,220	\$362,030	\$515,750	\$3,698,071	\$2,586,030	\$1,308,497	\$1,279,064	\$1,052,736	\$5,503,645
Full Value Per Capita (\$)	137,183	114,534	90,691	68,822	53,994	55,809	199,561	146,499	110,014	84,794	92,762	61,465
Average Annual Increase in FV (%)	0.7	0.3	-	0.1	0.2	0.1	(0.9)	(1.9)	(3.1)	(3.5)	(3.0)	(4.7)
Top Ten TaxPayers as % of Total	7.0	8.1	9.8	10.7	12.3	11.8	7.1	5.6	6.2	7.1	4.7	5.8
Demographic												
Population 2010 Census	32,508	22,086	14,390	8,475	6,753	10,826	14,618	16,031	11,292	16,767	10,791	89,593
PCI as % of U.S.	141.7	120.3	104.2	90.3	80.9	79.1	177.7	136.7	122.0	101.6	104.4	76.7
MFI as % of U.S.	150.3	130.5	111.2	98.5	87.3	84.6	179.3	155.4	144.1	115.7	128.2	75.4
Population Change 2000-2010 (%)	7.6	6.1	5.8	4.7	0.6	1.4	2.9	3.6	4.9	2.6	7.9	(1.0)
County Annual Unemployment Rate (BLS Data, %)	4.8	4.8	5.0	5.2	5.3	5.3	5.2	5.2	5.2	5.3	5.3	5.7
Poverty Rate (%)	5.7	6.7	8.3	10.5	13.4	15.3	4.6	4.6	5.1	8.4	6.2	19.7
Financial - General Fund												
Total General Fund Revenues (\$000)	\$ 40,696	\$ 26,857	\$ 17,085	\$ 8,040	\$ 5,438	\$ 7,244	\$ 88,022	\$ 60,199	\$ 37,373	\$ 45,475	\$ 34,603	\$ 289,439
General Fund Balance as % of Revenues	39.9	36.8	35.4	35.7	35.6	23.8	21.6	20.0	14.9	12.5	13.0	4.5
Unassigned Fund Balance as % of Revenues	26.5	24.9	24.5	25.0	28.0	19.5	13.8	13.1	10.3	10.0	9.3	2.6
Available GF Fund Balance as % of Revenue	37.9	32.3	32.7	33.0	33.9	19.5	19.2	18.8	14.8	11.9	9.6	4.4
General Net Cash as % of General Revenues	36.3	33.9	32.9	33.0	32.0	18.6	25.8	23.5	19.0	15.5	18.7	6.3
Financial - Operating Funds (GF + others entered in PFMS)												
Total Operating Fund Revenues (\$000)	\$ 49,572	\$ 31,954	\$ 18,732	\$ 8,345	\$ 6,179	\$ 6,324	\$ 88,022	\$ 59,995	\$ 37,332	\$ 44,363	\$ 33,961	\$ 288,614
Operating Fund Balance as % of Operating Revenues	43.1	37.5	37.1	37.4	35.8	24.5	21.6	20.2	15.1	12.7	14.1	4.6
Unassigned Operating Fund Balance as % of Operating Revenues	22.9	21.2	21.9	21.3	23.8	17.4	4.8	5.2	3.9	3.5	1.7	4.4
Available Operating Fund Balance as % of Operating Revenue	36.2	31.7	30.6	30.2	31.1	21.1	19.4	18.9	14.9	12.0	10.7	4.4
Operating Net Cash as % of Operating Revenues	41.0	36.9	34.5	33.9	29.1	22.1	25.8	23.9	19.1	15.8	17.1	6.3
Governmental Activities (GASB 34)												
Operating Revenues (\$000)	\$ 59,127	\$ 35,270	\$ 22,437	\$ 10,750	\$ 7,983	\$ 9,425	\$ 91,243	\$ 67,272	\$ 41,423	\$ 51,600	\$ 112,888	\$ 337,873
Quick Ratio	7.2	6.7	6.7	6.7	8.0	4.1	5.9	6.6	6.2	4.5	2.5	2.3
Current Ratio	9.3	8.8	9.5	10.2	11.9	6.6	6.3	8.5	8.1	5.9	4.7	3.1
Net Cash as % of Operating Revenues	74.4	69.8	59.7	58.7	55.2	42.9	38.7	39.3	29.0	26.1	18.8	14.5
Long-Term Debt as % of Operating Revenues	22.4	15.3	23.7	29.9	29.4	9.2	40.1	36.3	34.0	27.1	62.8	26.1
Debt												
Direct Net Debt as % of Full Value	0.8	1.0	1.2	1.6	2.1	1.8	1.1	1.1	1.3	1.4	2.3	3.2
Direct Net Debt Per Capita (\$)	1,223	1,231	1,157	1,183	1,208	1,141	1,993	1,809	1,675	1,315	1,531	1,970
Debt Burden (Overall Net Debt as % FV)	2.3	2.7	2.8	3.5	4.4	5.4	1.5	1.4	1.4	1.6	3.4	3.4
Overall Net Debt Per Capita (\$)	3,159	3,004	2,721	2,437	2,381	2,921	3,666	2,212	1,838	1,438	1,766	2,328
Debt Service as % of OE	8.3	8.7	8.7	9.3	9.5	10.8	5.5	6.1	4.9	4.0	5.6	3.8
Payout, 10 Yrs	83.3	83.7	88.1	88.1	80.6	79.8	96.2	84.3	92.0	93.6	76.7	78.8
Scorecard Metrics												
5-Yr \$ Change in Fund Balance as a % of Revenues	7.6	7.1	7.4	6.3	7.9	7.1	5.7	6.4	4.4	3.8	1.6	(1.1)
5-Yr \$ Change in Cash Balance as a % of Revenues	8.8	8.6	8.6	8.4	6.5	6.3	8.6	6.9	4.9	5.2	1.1	(1.1)
3-Yr Avg of Moody's ANPL / Full Value	1.4	1.4	1.7	1.9	2.1	2.8	1.9	2.5	2.5	4.2	3.7	10.1
3-Yr Avg of Moody's ANPL / Operating Revenues	160.1	141.9	127.8	126.6	139.1	160.9	96.1	109.3	103.1	123.3	113.3	193.6
Net Direct Debt / Operating Revenues (x)	0.8	0.9	0.9	1.1	1.1	1.2	0.5	0.5	0.5	0.4	0.6	64.4

Medians And Credit Factors: Massachusetts Local Governments

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Medians And Credit Factors: Massachusetts Local Governments

S&P Global Ratings maintains active general obligation (GO) ratings on 205 municipalities in the State of Massachusetts. The following tables and chart provide data for publicly rated local governments across the state as of Aug. 4, 2017.

Table 1

	Rating							Average
	AAA	AA+	AA	AA-	A+	A	A-	
Projected per capita EBI (%)	172.7	128.7	118.3	94.6	80.1	69.5	73.1	128.9
Market value per capita (\$)	222,904	150,757	104,056	74,600	60,160	48,646	59,555	142,954
Available general fund (%)	18.6	14.9	12.2	11.1	10.9	6.5	3.1	14.7
General fund performance (%)	2.8	1.8	1.6	0.4	(0.1)	(2.1)	1.0	1.6
Cash and expense (%)	38.8	33.1	28.4	26.8	19.6	14.6	11.1	32.7
Carrying charge (%)	5.7	4.1	4.0	4.3	3.3	6.5	2.9	4.5
Pension ARC + OPEB as % expense	6.8	6.3	7.1	8.0	10.8	7.8	12.7	6.8

EBI—Effective buying income. ARC—Annual required contribution. OPEB—Other postemployment benefits.

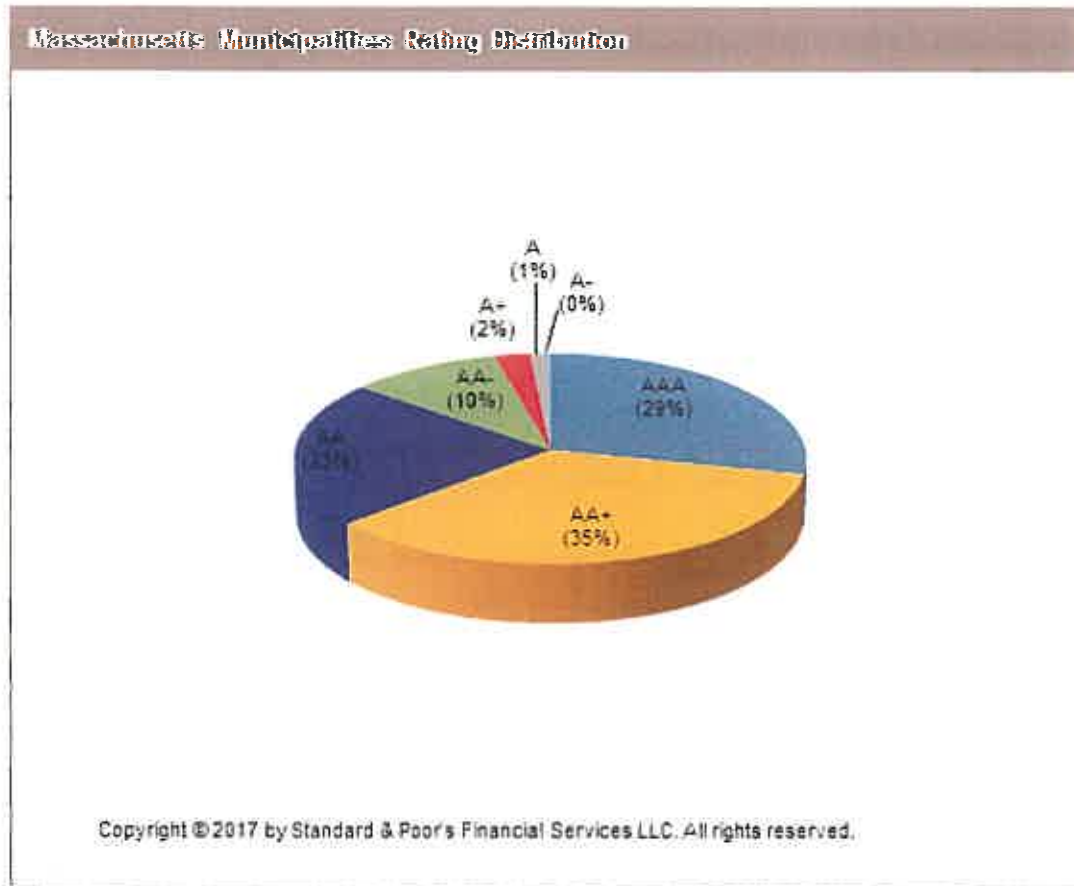
Table 2

(%)	Rating							Average
	AAA	AA+	AA	AA-	A+	A	A-	
Large balance (positive adjustment)	0	0	0	0	0	0	0	0
Broad and diverse (positive adjustment)	95	91	88	82	80	50	100	90
No plan for pension/OPEB (negative adjustment)	5	23	42	82	80	100	100	31

OPEB—Other postemployment benefits.

Table 3

Score (%)	Rating							Average
	AAA	AA+	AA	AA-	A+	A	A-	
Strong	36	9	2	14	0	0	0	15
Good	61	66	35	23	0	50	0	51
Standard	3	24	63	64	100	50	100	33



Only a rating committee may determine a rating action and this report does not constitute a rating action.

Pension and OPEB: S&P Metrics

Among areas of analytic focus when assessing the pension and OPEB burden will be:

- The required annual pension payment plus OPEB payment as a percent of total governmental funds expenditures. **A combined carrying charge of 10% or more will be considered elevated**, however, S&P will consider whether it expects the elevated payments to result in lower future obligations.
- The **actuarial funded ratio(s) of the pension plan(s)** a local government participates in or sponsors. If the ratio(s) are **less than 80%**, they will receive further review especially when the carrying charge is elevated. S&P also considers the magnitude of the unfunded obligation in tandem with the funded ratio(s) when assessing the potential for stress.
- The contributions actually made to all pension plans a local government participates in or sponsors. The degree to which a local government **contributes less than its full required contribution(s)** could be an indication of either short-term cash flow issues or a willingness of management to defer difficult decisions.
- The **OPEB costs exceed 5% of total governmental funds expenditures** and the local government has limited flexibility to change or amend these benefits.