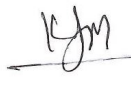





Conor Baldwin  
Chief Financial Officer

## MEMORANDUM

**TO:** Kevin J. Murphy, City Manager   
**FROM:** Conor Baldwin, Chief Financial Officer   
**CC:** Rodney Conley, Deputy CFO  
**DATE:** October 31, 2017

**SUBJECT:** 10/24/17 MOTION 10.3 by C. Milinazzo - Req. City Mgr. Prepare A Detail List Of All Estimated Costs Associated With Both High School Locations And The Direct Impact To The Taxpayer Including Soft Costs, Construction Costs, And Ancillary Or Related Costs I.E. Article 97, Water And Sewer Upgrades, Transportation And Pedestrian Improvements, Potential Eminent Domain Costs, And Busing Costs, Etc.

At the last City Council meeting on October 24<sup>th</sup>, a response was provided which outlined the various ancillary costs that were identified by city officials as part of the Cawley option, but were not included in the original project budget estimate provided by Skanska & Perkins Eastman.

Enclosed with this memo is a copy of that response for reference, as it included the projected debt service schedules for each capital improvement. Also enclosed is a table which consolidates the detailed cost estimates provided by the city's OPM and Architect for the LHS project, Skanska and Perkins Eastman, as well as the various ancillary cost estimates provided by city officials. The summaries attached include costs for the LHS Downtown Addition/ Renovation Option #3 – Expanded Site and for the New School Cawley Site – 5 Story Option.

The cost categories were collapsed in order to make the report easier to understand and the grand totals include all itemized subcategories from the Perkins Eastman report given to the City Council on June 6<sup>th</sup>, 2017. For example, the 'estimated construction cost' category includes all associated costs for constructing the physical building such as foundation, superstructure, roofing, services, HVAC, furnishings & equipment, etc., as well as any cost for site preparation, remediation, and improvements. The 'soft cost' category includes all expenses for architectural and engineering services, OPM and legal fees, utility allowance, and any necessary land acquisition costs. Finally, the construction contingencies are estimated as percentages of the total project cost.

In order to project the total tax impact for each project, the finance team ran several calculations on each ancillary expense's impact on the tax bill for the average single family home in Lowell, which in FY2017 was valued at \$253,908. A tax impact calculation was also run on the estimated impact of the annual cost to bus students to the Cawley Site which, based on the report



Conor Baldwin  
Chief Financial Officer

presented to the Lowell School Committee, could reach \$3.2 million if it required the purchase of 46 additional buses. However, the report to the School Committee also contained a preliminary plan which would eliminate the city-wide school model and reconfigure school start/release times to accommodate busing to Cawley from within the existing appropriation at a *de minimis* cost. No further information has been received regarding the busing cost and the city must therefore assume a cost range from \$0 to \$3.2 million. In running the calculations for discussion purposes, the debt service schedules for each ancillary expense were used and the residential tax impact from highest year's debt service expense (principal and interest) was calculated using the FY2017 valuations and tax rate then included in the attached table.

It is estimated, based on a number of assumptions included in this and previous reports, that the tax impact of the LHS Downtown Addition/ Renovation Option #3 – Expanded Site is \$281.00 to the average single family home. For the New School Cawley Site – 5 story option, the direct tax impact to the average single family home—including all identified ancillary costs and assuming that the busing is absorbed into the school budget—would be \$318.97. In order to fund the water and sewer improvements, a 2% increase to the sewer rate and a 0.9% increase to the water rate would be required to fund the capital improvements in the respective enterprise funds. If the preliminary busing plan from the School Department cannot be implemented and \$3.2 million is needed to fund transportation to the Cawley site, then the direct tax impact to the average single family home would increase from \$318.97 to \$416.63.

During discussion on Councilor Milinazzo's motion at the October 24<sup>th</sup> City Council meeting, Councilor Rourke requested that all tax impact numbers be included for the five options presented to the Council for consideration in June. For the full renovation option, with a local share of \$130,022,882; the tax increase would be \$255 and for the Add/Reno Option #2 – Existing Site, with a local share of \$135,320,524; the tax increase would be \$266. Finally, for the New School Cawley Site – 4 Story Option, with a local share of \$152,160,821; the tax increase—including all ancillary costs associated with the 5 story option and without any additional busing expenses—would be \$324.97. If the busing cost is added to the 5 story option at a cost of \$3.2 million, the tax impact would increase to \$422.63.

Please let me know if there are any questions.


<u>Expense Category</u>	<u>Downtown - Option 3</u>	<u>Tax Bill Impact</u>	<u>Cawley Site - 5 Story Option</u>	<u>Tax Bill Impact</u>	<u>Sewer Rate Increase</u>	<u>Water Rate Increase</u>
Estimated Construction Cost	\$276,141,914.00		\$269,659,408.00			
Estimated Soft Costs (Includes \$2M for Eminent Domain on Downtown Option #3) (No amounts included for ROW acquisition for Cawley option)	\$52,767,371.00		\$48,630,710.00			
Estimated Contingency	\$23,721,769.00		\$17,740,674.00			
Total Estimated Project Budget	\$352,631,054.00		\$336,030,792.00			
<b>Total Estimated City Share of Project Budget</b>	<b>\$143,232,657.00</b>	<b>\$281.00</b>	<b>\$149,439,672.00</b>	<b>\$293.00</b>		
<b>Estimated Ancillary Costs*</b>	<b>\$ -</b>	<b>\$0.00</b>	<b>\$11,424,500.00</b>	<b>\$25.97</b>		
Park Improvements (Article 97 Replication)	\$ -	\$ -	\$1,970,000.00	\$ 5.22		
Sidewalk Improvements	\$ -	\$ -	\$1,054,500.00	\$ 2.81		
Traffic Improvements	\$ -	\$ -	\$1,200,000.00	\$ 4.36		
Roadway Improvements	\$ -	\$ -	\$500,000.00	\$ 1.37		
MSBA Reimbursement Payback for 2012 Coburn Hall Roof	\$ -	\$ -	\$400,000.00	\$ 12.21		
Stormwater Improvements	\$ -	\$ -	\$5,000,000.00		2.0%	
Replace Rogers St. 6" Water Main	\$ -	\$ -	\$1,300,000.00			0.9%
<b>TOTAL ESTIMATED CITY COSTS</b>	<b>\$143,232,657.00</b>		<b>\$160,864,172.00</b>			
<b>Student Transportation (Busing) - Approximate Annual Cost</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$3,200,000.00</b>	<b>**</b>		
<b>TOTAL DIRECT TAX IMPACT (Including Estimated Ancillary Costs)</b>		<b>\$281.00</b>		<b>\$318.97</b>		
<p>*Tax impact for ancillary cost is estimate for annual debt service. MSBA reimbursement is lump sum payback</p> <p>**The cost for student transportation is described in detail within the narrative of the memo. Because of the variable nature of the costs provided by the School Department, a hard cost can not be included</p>						



Conor Baldwin  
Chief Financial Officer

## MEMORANDUM

**TO:** Kevin J. Murphy, City Manager 

**FROM:** Conor Baldwin, Chief Financial Officer 

**CC:** Rodney Conley, Deputy CFO

**DATE:** October 18, 2017

**SUBJECT:** **VERBAL MOTION by C. Milinazzo** - Req. City Mgr. provide ancillary cost summary for LHS project and funding plan.

Last week, Councilor Milinazzo asked that the Administration compile a summary of the ancillary costs associated with the Lowell High School building project at the Cawley site. The following costs have been identified as items outside the scope of the LHS project and have been included in reports from various city officials over the course of the last several months.

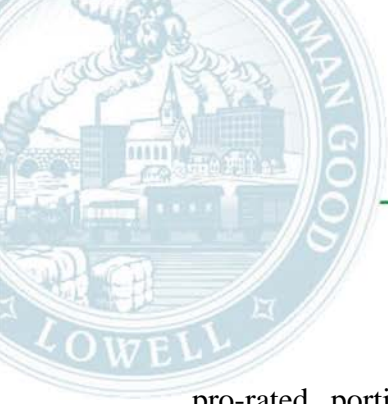
1. \$1.97 million (park improvements)
2. \$1.2 million (traffic signalization)
3. \$500,000 (roadway improvements for traffic)
4. \$1,054,500 (sidewalk improvements)
5. \$5 million (sewer improvements)
6. \$1.3 million (water improvements)

**SUBTOTAL:           \$11,024,500**

The costs listed above assume the maximum amounts estimated by city departments. The city utility improvements for water and sewer are not eligible for reimbursement by MSBA. However, costs savings could be realized by utilizing the same designer and construction company hired to install similar systems to mitigate storm water impact due to the new building.

Other than these capital improvements, busing is projected to cost anywhere from \$0 to \$3.2 million, annually. The numbers at this time cannot be refined down to a more definitive cost until certain decisions are made in regards to potential new bell schedules and bus routes, city-wide. As mentioned in last week's motion response, school, city, and UMASS Lowell officials began studying current routes utilizing optimization software and algorithms to analyze efficiency of the existing configuration. The goal of this project is to cut busing costs and reduce student travel time.

In regards to the reimbursement of the new softball field along the Douglas Road section of the Cawley site, Assistant City Manager Mike McGovern spoke with Karl Brown of the MSBA, who confirmed that this is an eligible reimbursement. Finally, the city will need to pay back a



**Conor Baldwin**  
*Chief Financial Officer*

pro-rated portion its 2012 reimbursement for the Coburn Hall roof in the amount of approximately \$400,000.

Below is a summary of all items:

- Bonded Items: \$11,024,500
- Annual Cost (Busing) \$3,200,000
- One-time Cost (reimbursement) \$400,000

Debt service schedules including principal and interest payments for capital improvements are included with this response from the city's financial advisor, First Southwest. Interest rates have been projected using current market data and the payback period each bond was structured using the relevant statutory term for each capital item. It was also assumed that the utility improvements will be funded using general obligation bonds sold by the city, however it is possible that the city may be able to finance portions of the work through the Massachusetts Clean Water Trust and leverage lower interest rates.

Please let me know if there are any questions.

Fiscal Year	Sewer Improvements (WWTP Enterprise)	Water Improvements (Water Enterprise)	Park Improvements (General Fund)	Roadway / Traffic Improvements (General Fund)	Sidewalk Improvement (General Fund)	Traffic Signals (General Fund)	Total
FY19	125,000	32,500	34,475	8,750	18,454	19,500	238,679
FY20	323,125	84,500	167,200	42,063	95,366	142,294	854,548
FY21	319,375	83,500	168,613	41,188	88,863	138,881	840,419
FY22	320,500	82,500	169,850	45,225	91,850	140,388	850,313
FY23	321,375	81,500	170,913	44,175	89,750	141,731	849,444
FY24	322,000	85,375	166,888	43,125	87,650	137,994	843,031
FY25	322,375	84,125	167,775	42,075	90,463	139,175	845,988
FY26	322,500	82,875	168,488	41,025	88,188	140,194	843,269
FY27	322,375	81,625	169,025	44,888	90,825	141,050	849,788
FY28	322,000	85,250	169,388	43,663	88,375	141,744	850,419
FY29	321,375	83,750	169,575	42,438	90,838	142,275	850,250
FY30	320,500	82,250	169,588	41,213	88,213		701,763
FY31	324,250	85,625	169,425	44,900	90,500		714,700
FY32	322,625	83,875	169,088	43,500	92,613		711,700
FY33	320,750	82,125	168,575	42,100	89,638		703,188
FY34	323,500	85,250	167,888	40,700	91,575		708,913
FY35	320,875	83,250					404,125
FY36	322,875	86,125					409,000
FY37	319,500	83,875					403,375
FY38	320,750	81,625					402,375
FY39	321,500	84,250					405,750
FY40	321,750	81,750					403,500
FY41	321,500	84,125					405,625
FY42	320,750	86,250					407,000
FY43	324,375	83,250					407,625
FY44	322,375	85,125					407,500
FY45	319,875	81,875					401,750
FY46	321,750	83,500					405,250
FY47	322,875	84,875					407,750
FY48	323,250	86,000					409,250
FY49	322,875	82,000					404,875
<b>Total</b>	<b>\$ 9,780,500</b>	<b>\$ 2,544,500</b>	<b>\$ 2,566,750</b>	<b>\$ 651,025</b>	<b>\$ 1,373,158</b>	<b>\$ 1,425,225</b>	<b>\$ 18,341,158</b>

	Sewer Improvements (WWTP Enterprise)	Water Improvements (Water Enterprise)	Park Improvements (General Fund)	Roadway / Traffic Improvements (General Fund)	Sidewalk Improvement (General Fund)	Traffic Signals (General Fund)	Total
Principal	5,000,000	1,300,000	1,970,000	500,000	1,054,500	1,200,000	11,024,500
Interest	4,780,500	1,244,500	596,750	151,025	318,658	225,225	7,316,658
<b>Total</b>	<b>\$ 9,780,500</b>	<b>\$ 2,544,500</b>	<b>\$ 2,566,750</b>	<b>\$ 651,025</b>	<b>\$ 1,373,158</b>	<b>\$ 1,425,225</b>	<b>\$ 18,341,158</b>

**City of Lowell, Massachusetts**  
 General Obligation Bonds, Dated September 1, 2018  
 \$5,000,000 Sewer Improvements - Level Debt - 30 years  
 Interest Estimated at 5.0% - Subject to Change

**Debt Service Schedule**

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
09/01/2018	-	-	-	-	-
03/01/2019	-	-	125,000.00	125,000.00	-
06/30/2019	-	-	-	-	125,000.00
09/01/2019	75,000.00	5.000%	125,000.00	200,000.00	-
03/01/2020	-	-	123,125.00	123,125.00	-
06/30/2020	-	-	-	-	323,125.00
09/01/2020	75,000.00	5.000%	123,125.00	198,125.00	-
03/01/2021	-	-	121,250.00	121,250.00	-
06/30/2021	-	-	-	-	319,375.00
09/01/2021	80,000.00	5.000%	121,250.00	201,250.00	-
03/01/2022	-	-	119,250.00	119,250.00	-
06/30/2022	-	-	-	-	320,500.00
09/01/2022	85,000.00	5.000%	119,250.00	204,250.00	-
03/01/2023	-	-	117,125.00	117,125.00	-
06/30/2023	-	-	-	-	321,375.00
09/01/2023	90,000.00	5.000%	117,125.00	207,125.00	-
03/01/2024	-	-	114,875.00	114,875.00	-
06/30/2024	-	-	-	-	322,000.00
09/01/2024	95,000.00	5.000%	114,875.00	209,875.00	-
03/01/2025	-	-	112,500.00	112,500.00	-
06/30/2025	-	-	-	-	322,375.00
09/01/2025	100,000.00	5.000%	112,500.00	212,500.00	-
03/01/2026	-	-	110,000.00	110,000.00	-
06/30/2026	-	-	-	-	322,500.00
09/01/2026	105,000.00	5.000%	110,000.00	215,000.00	-
03/01/2027	-	-	107,375.00	107,375.00	-
06/30/2027	-	-	-	-	322,375.00
09/01/2027	110,000.00	5.000%	107,375.00	217,375.00	-
03/01/2028	-	-	104,625.00	104,625.00	-
06/30/2028	-	-	-	-	322,000.00
09/01/2028	115,000.00	5.000%	104,625.00	219,625.00	-
03/01/2029	-	-	101,750.00	101,750.00	-
06/30/2029	-	-	-	-	321,375.00
09/01/2029	120,000.00	5.000%	101,750.00	221,750.00	-
03/01/2030	-	-	98,750.00	98,750.00	-
06/30/2030	-	-	-	-	320,500.00
09/01/2030	130,000.00	5.000%	98,750.00	228,750.00	-
03/01/2031	-	-	95,500.00	95,500.00	-
06/30/2031	-	-	-	-	324,250.00
09/01/2031	135,000.00	5.000%	95,500.00	230,500.00	-
03/01/2032	-	-	92,125.00	92,125.00	-
06/30/2032	-	-	-	-	322,625.00
09/01/2032	140,000.00	5.000%	92,125.00	232,125.00	-
03/01/2033	-	-	88,625.00	88,625.00	-
06/30/2033	-	-	-	-	320,750.00
09/01/2033	150,000.00	5.000%	88,625.00	238,625.00	-
03/01/2034	-	-	84,875.00	84,875.00	-
06/30/2034	-	-	-	-	323,500.00
09/01/2034	155,000.00	5.000%	84,875.00	239,875.00	-
03/01/2035	-	-	81,000.00	81,000.00	-
06/30/2035	-	-	-	-	320,875.00
09/01/2035	165,000.00	5.000%	81,000.00	246,000.00	-
03/01/2036	-	-	76,875.00	76,875.00	-
06/30/2036	-	-	-	-	322,875.00
09/01/2036	170,000.00	5.000%	76,875.00	246,875.00	-
03/01/2037	-	-	72,625.00	72,625.00	-
06/30/2037	-	-	-	-	319,500.00
09/01/2037	180,000.00	5.000%	72,625.00	252,625.00	-
03/01/2038	-	-	68,125.00	68,125.00	-
06/30/2038	-	-	-	-	320,750.00
09/01/2038	190,000.00	5.000%	68,125.00	258,125.00	-
03/01/2039	-	-	63,375.00	63,375.00	-
06/30/2039	-	-	-	-	321,500.00
09/01/2039	200,000.00	5.000%	63,375.00	263,375.00	-
03/01/2040	-	-	58,375.00	58,375.00	-
06/30/2040	-	-	-	-	321,750.00
09/01/2040	210,000.00	5.000%	58,375.00	268,375.00	-
03/01/2041	-	-	53,125.00	53,125.00	-
06/30/2041	-	-	-	-	321,500.00
09/01/2041	220,000.00	5.000%	53,125.00	273,125.00	-
03/01/2042	-	-	47,625.00	47,625.00	-
06/30/2042	-	-	-	-	320,750.00
09/01/2042	235,000.00	5.000%	47,625.00	282,625.00	-
03/01/2043	-	-	41,750.00	41,750.00	-
06/30/2043	-	-	-	-	324,375.00
09/01/2043	245,000.00	5.000%	41,750.00	286,750.00	-
03/01/2044	-	-	35,625.00	35,625.00	-
06/30/2044	-	-	-	-	322,375.00
09/01/2044	255,000.00	5.000%	35,625.00	290,625.00	-
03/01/2045	-	-	29,250.00	29,250.00	-
06/30/2045	-	-	-	-	319,875.00
09/01/2045	270,000.00	5.000%	29,250.00	299,250.00	-
03/01/2046	-	-	22,500.00	22,500.00	-
06/30/2046	-	-	-	-	321,750.00
09/01/2046	285,000.00	5.000%	22,500.00	307,500.00	-
03/01/2047	-	-	15,375.00	15,375.00	-
06/30/2047	-	-	-	-	322,875.00
09/01/2047	300,000.00	5.000%	15,375.00	315,375.00	-
03/01/2048	-	-	7,875.00	7,875.00	-
06/30/2048	-	-	-	-	323,250.00
09/01/2048	315,000.00	5.000%	7,875.00	322,875.00	-
06/30/2049	-	-	-	-	322,875.00
<b>Total</b>	<b>\$5,000,000.00</b>	<b>-</b>	<b>\$4,780,500.00</b>	<b>\$9,780,500.00</b>	<b>-</b>

**Yield Statistics**

Bond Year Dollars.....	\$95,610.00
Average Life.....	19.122 Years
Average Coupon.....	5.0000000%
Net Interest Cost (NIC).....	5.0000000%
True Interest Cost (TIC).....	5.0000000%
Bond Yield for Arbitrage Purposes.....	5.0000000%
All Inclusive Cost (AIC).....	5.0000000%

**IRS Form 8098**

Net Interest Cost.....	5.0000000%
Weighted Average Maturity.....	19.122 Years

**City of Lowell, Massachusetts**  
 General Obligation Bonds, Dated September 1, 2018  
 \$1,300,000 Water Improvements - Level Debt - 30 years  
 Interest Estimated at 5.0% - Subject to Change

**Debt Service Schedule**

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
09/01/2018	-	-	-	-	-
03/01/2019	-	-	32,500.00	32,500.00	-
06/30/2019	-	-	-	-	32,500.00
09/01/2019	20,000.00	5.000%	32,500.00	52,500.00	-
03/01/2020	-	-	32,000.00	32,000.00	-
06/30/2020	-	-	-	-	84,500.00
09/01/2020	20,000.00	5.000%	32,000.00	52,000.00	-
03/01/2021	-	-	31,500.00	31,500.00	-
06/30/2021	-	-	-	-	83,500.00
09/01/2021	20,000.00	5.000%	31,500.00	51,500.00	-
03/01/2022	-	-	31,000.00	31,000.00	-
06/30/2022	-	-	-	-	82,500.00
09/01/2022	20,000.00	5.000%	31,000.00	51,000.00	-
03/01/2023	-	-	30,500.00	30,500.00	-
06/30/2023	-	-	-	-	81,500.00
09/01/2023	25,000.00	5.000%	30,500.00	55,500.00	-
03/01/2024	-	-	29,875.00	29,875.00	-
06/30/2024	-	-	-	-	85,375.00
09/01/2024	25,000.00	5.000%	29,875.00	54,875.00	-
03/01/2025	-	-	29,250.00	29,250.00	-
06/30/2025	-	-	-	-	84,125.00
09/01/2025	25,000.00	5.000%	29,250.00	54,250.00	-
03/01/2026	-	-	28,625.00	28,625.00	-
06/30/2026	-	-	-	-	82,875.00
09/01/2026	25,000.00	5.000%	28,625.00	53,625.00	-
03/01/2027	-	-	28,000.00	28,000.00	-
06/30/2027	-	-	-	-	81,625.00
09/01/2027	30,000.00	5.000%	28,000.00	58,000.00	-
03/01/2028	-	-	27,250.00	27,250.00	-
06/30/2028	-	-	-	-	85,250.00
09/01/2028	30,000.00	5.000%	27,250.00	57,250.00	-
03/01/2029	-	-	26,500.00	26,500.00	-
06/30/2029	-	-	-	-	83,750.00
09/01/2029	30,000.00	5.000%	26,500.00	56,500.00	-
03/01/2030	-	-	25,750.00	25,750.00	-
06/30/2030	-	-	-	-	82,250.00
09/01/2030	35,000.00	5.000%	25,750.00	60,750.00	-
03/01/2031	-	-	24,875.00	24,875.00	-
06/30/2031	-	-	-	-	85,625.00
09/01/2031	35,000.00	5.000%	24,875.00	59,875.00	-
03/01/2032	-	-	24,000.00	24,000.00	-
06/30/2032	-	-	-	-	83,875.00
09/01/2032	35,000.00	5.000%	24,000.00	59,000.00	-
03/01/2033	-	-	23,125.00	23,125.00	-
06/30/2033	-	-	-	-	82,125.00
09/01/2033	40,000.00	5.000%	23,125.00	63,125.00	-
03/01/2034	-	-	22,125.00	22,125.00	-
06/30/2034	-	-	-	-	85,250.00
09/01/2034	40,000.00	5.000%	22,125.00	62,125.00	-
03/01/2035	-	-	21,125.00	21,125.00	-
06/30/2035	-	-	-	-	83,250.00
09/01/2035	45,000.00	5.000%	21,125.00	66,125.00	-
03/01/2036	-	-	20,000.00	20,000.00	-
06/30/2036	-	-	-	-	86,125.00
09/01/2036	45,000.00	5.000%	20,000.00	65,000.00	-
03/01/2037	-	-	18,875.00	18,875.00	-
06/30/2037	-	-	-	-	83,875.00
09/01/2037	45,000.00	5.000%	18,875.00	63,875.00	-
03/01/2038	-	-	17,750.00	17,750.00	-
06/30/2038	-	-	-	-	81,625.00
09/01/2038	50,000.00	5.000%	17,750.00	67,750.00	-
03/01/2039	-	-	16,500.00	16,500.00	-
06/30/2039	-	-	-	-	84,250.00
09/01/2039	50,000.00	5.000%	16,500.00	66,500.00	-
03/01/2040	-	-	15,250.00	15,250.00	-
06/30/2040	-	-	-	-	81,750.00
09/01/2040	55,000.00	5.000%	15,250.00	70,250.00	-
03/01/2041	-	-	13,875.00	13,875.00	-
06/30/2041	-	-	-	-	84,125.00
09/01/2041	60,000.00	5.000%	13,875.00	73,875.00	-
03/01/2042	-	-	12,375.00	12,375.00	-
06/30/2042	-	-	-	-	86,250.00
09/01/2042	60,000.00	5.000%	12,375.00	72,375.00	-
03/01/2043	-	-	10,875.00	10,875.00	-
06/30/2043	-	-	-	-	83,250.00
09/01/2043	65,000.00	5.000%	10,875.00	75,875.00	-
03/01/2044	-	-	9,250.00	9,250.00	-
06/30/2044	-	-	-	-	85,125.00
09/01/2044	65,000.00	5.000%	9,250.00	74,250.00	-
03/01/2045	-	-	7,625.00	7,625.00	-
06/30/2045	-	-	-	-	81,875.00
09/01/2045	70,000.00	5.000%	7,625.00	77,625.00	-
03/01/2046	-	-	5,875.00	5,875.00	-
06/30/2046	-	-	-	-	83,500.00
09/01/2046	75,000.00	5.000%	5,875.00	80,875.00	-
03/01/2047	-	-	4,000.00	4,000.00	-
06/30/2047	-	-	-	-	84,875.00
09/01/2047	80,000.00	5.000%	4,000.00	84,000.00	-
03/01/2048	-	-	2,000.00	2,000.00	-
06/30/2048	-	-	-	-	86,000.00
09/01/2048	80,000.00	5.000%	2,000.00	82,000.00	-
06/30/2049	-	-	-	-	82,000.00
<b>Total</b>	<b>\$1,300,000.00</b>	<b>-</b>	<b>\$1,244,500.00</b>	<b>\$2,544,500.00</b>	<b>-</b>

**Yield Statistics**

Bond Year Dollars.....	\$24,890.00
Average Life.....	19.146 Years
Average Coupon.....	5.0000000%
Net Interest Cost (NIC).....	5.0000000%
True Interest Cost (TIC).....	5.0000000%
Bond Yield for Arbitrage Purposes.....	5.0000000%
All Inclusive Cost (AIC).....	5.0000000%

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Net Interest Cost.....	5.0000000%
Weighted Average Maturity.....	19.146 Years



**City of Lowell, Massachusetts**  
*General Obligation Bonds, Dated September 1, 2018*  
*\$1,970,000 Park Improvements - Level Debt - 15 years*  
*Interest Estimated at 3.5% - Subject to Change*

**Debt Service Schedule**

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
09/01/2018	-	-	-	-	-
03/01/2019	-	-	34,475.00	34,475.00	-
06/30/2019	-	-	-	-	34,475.00
09/01/2019	100,000.00	3.500%	34,475.00	134,475.00	-
03/01/2020	-	-	32,725.00	32,725.00	-
06/30/2020	-	-	-	-	167,200.00
09/01/2020	105,000.00	3.500%	32,725.00	137,725.00	-
03/01/2021	-	-	30,887.50	30,887.50	-
06/30/2021	-	-	-	-	168,612.50
09/01/2021	110,000.00	3.500%	30,887.50	140,887.50	-
03/01/2022	-	-	28,962.50	28,962.50	-
06/30/2022	-	-	-	-	169,850.00
09/01/2022	115,000.00	3.500%	28,962.50	143,962.50	-
03/01/2023	-	-	26,950.00	26,950.00	-
06/30/2023	-	-	-	-	170,912.50
09/01/2023	115,000.00	3.500%	26,950.00	141,950.00	-
03/01/2024	-	-	24,937.50	24,937.50	-
06/30/2024	-	-	-	-	166,887.50
09/01/2024	120,000.00	3.500%	24,937.50	144,937.50	-
03/01/2025	-	-	22,837.50	22,837.50	-
06/30/2025	-	-	-	-	167,775.00
09/01/2025	125,000.00	3.500%	22,837.50	147,837.50	-
03/01/2026	-	-	20,650.00	20,650.00	-
06/30/2026	-	-	-	-	168,487.50
09/01/2026	130,000.00	3.500%	20,650.00	150,650.00	-
03/01/2027	-	-	18,375.00	18,375.00	-
06/30/2027	-	-	-	-	169,025.00
09/01/2027	135,000.00	3.500%	18,375.00	153,375.00	-
03/01/2028	-	-	16,012.50	16,012.50	-
06/30/2028	-	-	-	-	169,387.50
09/01/2028	140,000.00	3.500%	16,012.50	156,012.50	-
03/01/2029	-	-	13,562.50	13,562.50	-
06/30/2029	-	-	-	-	169,575.00
09/01/2029	145,000.00	3.500%	13,562.50	158,562.50	-
03/01/2030	-	-	11,025.00	11,025.00	-
06/30/2030	-	-	-	-	169,587.50
09/01/2030	150,000.00	3.500%	11,025.00	161,025.00	-
03/01/2031	-	-	8,400.00	8,400.00	-
06/30/2031	-	-	-	-	169,425.00
09/01/2031	155,000.00	3.500%	8,400.00	163,400.00	-
03/01/2032	-	-	5,687.50	5,687.50	-
06/30/2032	-	-	-	-	169,087.50
09/01/2032	160,000.00	3.500%	5,687.50	165,687.50	-
03/01/2033	-	-	2,887.50	2,887.50	-
06/30/2033	-	-	-	-	168,575.00
09/01/2033	165,000.00	3.500%	2,887.50	167,887.50	-
06/30/2034	-	-	-	-	167,887.50
<b>Total</b>	<b>\$1,970,000.00</b>	<b>-</b>	<b>\$596,750.00</b>	<b>\$2,566,750.00</b>	<b>-</b>

**Yield Statistics**

Bond Year Dollars.....	\$17,050.00
Average Life.....	8.655 Years
Average Coupon.....	3.5000000%
Net Interest Cost (NIC).....	3.5000000%
True Interest Cost (TIC).....	3.5000000%
Bond Yield for Arbitrage Purposes.....	3.5000000%
All Inclusive Cost (AIC).....	3.5000000%

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Net Interest Cost.....	3.5000000%
Weighted Average Maturity.....	8.655 Years

**City of Lowell, Massachusetts**  
*General Obligation Bonds, Dated September 1, 2018*  
**\$500,000 Roadway/Traffic Improvements - Level Debt - 15 years**  
*Interest Estimated at 3.5% - Subject to Change*

**Debt Service Schedule**

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
09/01/2018	-	-	-	-	-
03/01/2019	-	-	8,750.00	8,750.00	-
06/30/2019	-	-	-	-	8,750.00
09/01/2019	25,000.00	3.500%	8,750.00	33,750.00	-
03/01/2020	-	-	8,312.50	8,312.50	-
06/30/2020	-	-	-	-	42,062.50
09/01/2020	25,000.00	3.500%	8,312.50	33,312.50	-
03/01/2021	-	-	7,875.00	7,875.00	-
06/30/2021	-	-	-	-	41,187.50
09/01/2021	30,000.00	3.500%	7,875.00	37,875.00	-
03/01/2022	-	-	7,350.00	7,350.00	-
06/30/2022	-	-	-	-	45,225.00
09/01/2022	30,000.00	3.500%	7,350.00	37,350.00	-
03/01/2023	-	-	6,825.00	6,825.00	-
06/30/2023	-	-	-	-	44,175.00
09/01/2023	30,000.00	3.500%	6,825.00	36,825.00	-
03/01/2024	-	-	6,300.00	6,300.00	-
06/30/2024	-	-	-	-	43,125.00
09/01/2024	30,000.00	3.500%	6,300.00	36,300.00	-
03/01/2025	-	-	5,775.00	5,775.00	-
06/30/2025	-	-	-	-	42,075.00
09/01/2025	30,000.00	3.500%	5,775.00	35,775.00	-
03/01/2026	-	-	5,250.00	5,250.00	-
06/30/2026	-	-	-	-	41,025.00
09/01/2026	35,000.00	3.500%	5,250.00	40,250.00	-
03/01/2027	-	-	4,637.50	4,637.50	-
06/30/2027	-	-	-	-	44,887.50
09/01/2027	35,000.00	3.500%	4,637.50	39,637.50	-
03/01/2028	-	-	4,025.00	4,025.00	-
06/30/2028	-	-	-	-	43,662.50
09/01/2028	35,000.00	3.500%	4,025.00	39,025.00	-
03/01/2029	-	-	3,412.50	3,412.50	-
06/30/2029	-	-	-	-	42,437.50
09/01/2029	35,000.00	3.500%	3,412.50	38,412.50	-
03/01/2030	-	-	2,800.00	2,800.00	-
06/30/2030	-	-	-	-	41,212.50
09/01/2030	40,000.00	3.500%	2,800.00	42,800.00	-
03/01/2031	-	-	2,100.00	2,100.00	-
06/30/2031	-	-	-	-	44,900.00
09/01/2031	40,000.00	3.500%	2,100.00	42,100.00	-
03/01/2032	-	-	1,400.00	1,400.00	-
06/30/2032	-	-	-	-	43,500.00
09/01/2032	40,000.00	3.500%	1,400.00	41,400.00	-
03/01/2033	-	-	700.00	700.00	-
06/30/2033	-	-	-	-	42,100.00
09/01/2033	40,000.00	3.500%	700.00	40,700.00	-
06/30/2034	-	-	-	-	40,700.00
<b>Total</b>	<b>\$500,000.00</b>	<b>-</b>	<b>\$151,025.00</b>	<b>\$651,025.00</b>	<b>-</b>

**Yield Statistics**

Bond Year Dollars.....	\$4,315.00
Average Life.....	8.630 Years
Average Coupon.....	3.500000%
Net Interest Cost (NIC).....	3.500000%
True Interest Cost (TIC).....	3.500000%
Bond Yield for Arbitrage Purposes.....	3.500000%
All Inclusive Cost (AIC).....	3.500000%

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Net Interest Cost.....	3.500000%
Weighted Average Maturity.....	8.630 Years

**City of Lowell, Massachusetts**  
*General Obligation Bonds, Dated September 1, 2018*  
*\$1,054,500 Sidewalk Improvements - Level Debt - 15 years*  
*Interest Estimated at 3.5% - Subject to Change*

**Debt Service Schedule**

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
09/01/2018	-	-	-	-	-
03/01/2019	-	-	18,453.75	18,453.75	-
06/30/2019	-	-	-	-	18,453.75
09/01/2019	59,500.00	3.500%	18,453.75	77,953.75	-
03/01/2020	-	-	17,412.50	17,412.50	-
06/30/2020	-	-	-	-	95,366.25
09/01/2020	55,000.00	3.500%	17,412.50	72,412.50	-
03/01/2021	-	-	16,450.00	16,450.00	-
06/30/2021	-	-	-	-	88,862.50
09/01/2021	60,000.00	3.500%	16,450.00	76,450.00	-
03/01/2022	-	-	15,400.00	15,400.00	-
06/30/2022	-	-	-	-	91,850.00
09/01/2022	60,000.00	3.500%	15,400.00	75,400.00	-
03/01/2023	-	-	14,350.00	14,350.00	-
06/30/2023	-	-	-	-	89,750.00
09/01/2023	60,000.00	3.500%	14,350.00	74,350.00	-
03/01/2024	-	-	13,300.00	13,300.00	-
06/30/2024	-	-	-	-	87,650.00
09/01/2024	65,000.00	3.500%	13,300.00	78,300.00	-
03/01/2025	-	-	12,162.50	12,162.50	-
06/30/2025	-	-	-	-	90,462.50
09/01/2025	65,000.00	3.500%	12,162.50	77,162.50	-
03/01/2026	-	-	11,025.00	11,025.00	-
06/30/2026	-	-	-	-	88,187.50
09/01/2026	70,000.00	3.500%	11,025.00	81,025.00	-
03/01/2027	-	-	9,800.00	9,800.00	-
06/30/2027	-	-	-	-	90,825.00
09/01/2027	70,000.00	3.500%	9,800.00	79,800.00	-
03/01/2028	-	-	8,575.00	8,575.00	-
06/30/2028	-	-	-	-	88,375.00
09/01/2028	75,000.00	3.500%	8,575.00	83,575.00	-
03/01/2029	-	-	7,262.50	7,262.50	-
06/30/2029	-	-	-	-	90,837.50
09/01/2029	75,000.00	3.500%	7,262.50	82,262.50	-
03/01/2030	-	-	5,950.00	5,950.00	-
06/30/2030	-	-	-	-	88,212.50
09/01/2030	80,000.00	3.500%	5,950.00	85,950.00	-
03/01/2031	-	-	4,550.00	4,550.00	-
06/30/2031	-	-	-	-	90,500.00
09/01/2031	85,000.00	3.500%	4,550.00	89,550.00	-
03/01/2032	-	-	3,062.50	3,062.50	-
06/30/2032	-	-	-	-	92,612.50
09/01/2032	85,000.00	3.500%	3,062.50	88,062.50	-
03/01/2033	-	-	1,575.00	1,575.00	-
06/30/2033	-	-	-	-	89,637.50
09/01/2033	90,000.00	3.500%	1,575.00	91,575.00	-
06/30/2034	-	-	-	-	91,575.00
<b>Total</b>	<b>\$1,054,500.00</b>	<b>-</b>	<b>\$318,657.50</b>	<b>\$1,373,157.50</b>	<b>-</b>

**Yield Statistics**

Bond Year Dollars.....	\$9,104.50
Average Life.....	8.634 Years
Average Coupon.....	3.5000000%
Net Interest Cost (NIC).....	3.5000000%
True Interest Cost (TIC).....	3.5000000%
Bond Yield for Arbitrage Purposes.....	3.5000000%
All Inclusive Cost (AIC).....	3.5000000%

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Net Interest Cost.....	3.5000000%
Weighted Average Maturity.....	8.634 Years

**City of Lowell, Massachusetts**  
*General Obligation Bonds, Dated September 1, 2018*  
*\$1,200,000 Traffic Signals - Level Debt - 10 years*  
*Interest Estimated at 3.25% - Subject to Change*

**Debt Service Schedule**

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
09/01/2018	-	-	-	-	-
03/01/2019	-	-	19,500.00	19,500.00	-
06/30/2019	-	-	-	-	19,500.00
09/01/2019	105,000.00	3.250%	19,500.00	124,500.00	-
03/01/2020	-	-	17,793.75	17,793.75	-
06/30/2020	-	-	-	-	142,293.75
09/01/2020	105,000.00	3.250%	17,793.75	122,793.75	-
03/01/2021	-	-	16,087.50	16,087.50	-
06/30/2021	-	-	-	-	138,881.25
09/01/2021	110,000.00	3.250%	16,087.50	126,087.50	-
03/01/2022	-	-	14,300.00	14,300.00	-
06/30/2022	-	-	-	-	140,387.50
09/01/2022	115,000.00	3.250%	14,300.00	129,300.00	-
03/01/2023	-	-	12,431.25	12,431.25	-
06/30/2023	-	-	-	-	141,731.25
09/01/2023	115,000.00	3.250%	12,431.25	127,431.25	-
03/01/2024	-	-	10,562.50	10,562.50	-
06/30/2024	-	-	-	-	137,993.75
09/01/2024	120,000.00	3.250%	10,562.50	130,562.50	-
03/01/2025	-	-	8,612.50	8,612.50	-
06/30/2025	-	-	-	-	139,175.00
09/01/2025	125,000.00	3.250%	8,612.50	133,612.50	-
03/01/2026	-	-	6,581.25	6,581.25	-
06/30/2026	-	-	-	-	140,193.75
09/01/2026	130,000.00	3.250%	6,581.25	136,581.25	-
03/01/2027	-	-	4,468.75	4,468.75	-
06/30/2027	-	-	-	-	141,050.00
09/01/2027	135,000.00	3.250%	4,468.75	139,468.75	-
03/01/2028	-	-	2,275.00	2,275.00	-
06/30/2028	-	-	-	-	141,743.75
09/01/2028	140,000.00	3.250%	2,275.00	142,275.00	-
06/30/2029	-	-	-	-	142,275.00
<b>Total</b>	<b>\$1,200,000.00</b>	<b>-</b>	<b>\$225,225.00</b>	<b>\$1,425,225.00</b>	<b>-</b>

**Yield Statistics**

Bond Year Dollars.....	\$6,930.00
Average Life.....	5.775 Years
Average Coupon.....	3.2500000%
Net Interest Cost (NIC).....	3.2500000%
True Interest Cost (TIC).....	3.2500000%
Bond Yield for Arbitrage Purposes.....	3.2500000%
All Inclusive Cost (AIC).....	3.2500000%

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Net Interest Cost.....	3.2500000%
Weighted Average Maturity.....	5.775 Years