



## **Employees Retirement System of the City of St. Louis**

**GASB 67/68 Report  
as of September 30, 2018**

**Produced by Cheiron**

**February 2019**

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**LETTER OF TRANSMITTAL**

February 19, 2019

Board of Pension Trustees  
Employees Retirement System of the City of St. Louis  
1114 Market Street, Suite 900  
St. Louis, Missouri 63101

Dear Members of the Board:

The purpose of this report is to provide accounting and financial reporting information under GASB 67 for the Employees Retirement System of the City of St. Louis and under GASB 68 for participating employers. This information includes:


- Determination of the discount rate as of September 30, 2018,
- Note disclosures and required supplementary information under GASB 67 for the System,
- Determination of collective amounts under GASB 68, and
- Schedules for the financial reporting of participating employers under GASB 68.

If you have any questions about the report or would like additional information, please let us know.

Sincerely,  
Cheiron



Stephen T. McElhaney, FSA, FCA, EA  
Principal Consulting Actuary



Michael J. Noble, FSA, FCA, EA  
Principal Consulting Actuary

**EMPLOYEES RETIREMENT SYSTEM OF THE CITY OF ST. LOUIS  
GASB 67 AND 68 REPORTING FOR SEPTEMBER 30, 2018 MEASUREMENT DATE**

**SECTION I - BOARD SUMMARY**

The purpose of this report is to provide accounting and financial disclosure information under Government Accounting Standards Board Statements 67 and 68 for the Employees Retirement System of the City of St. Louis and the participating employers. This information includes:

- Determination of the discount rate as of September 30, 2018,
- Note disclosures and required supplementary information under GASB 67 for the System,
- Determination of collective amounts under GASB 68, and
- Schedules for the financial reporting of participating employers under GASB 68.

**Highlights**

The measurement date for the Employees Retirement System of the City of St. Louis is September 30, 2018. Measurements are based on the fair value of assets as of September 30, 2018 and the Total Pension Liability as of the valuation date, September 30, 2018. There were no significant events during the year for which adjustments to either the assets or liabilities were needed.

The table below provides a summary of the key collective results during this measurement period.

<b>Table I-1</b>			
<b>Summary of Collective Results</b>			
Measurement Date			
9/30/2018                      9/30/2017			
Net Pension Liability	\$	169,188,149	\$ 173,714,705
Deferred Outflows		(3,638,353)	(1,890,573)
Deferred Inflows		10,104,493	4,115,284
Net Impact on Statement of Net Position	\$	175,654,289	\$ 175,939,416
Pension Expense (\$ Amount)	\$	29,075,975	\$ 29,863,934
Pension Expense (% of Payroll)		12.12%	12.46%

The Net Pension Liability (NPL) decreased approximately \$4.5 million since the prior measurement date due to experience gains, which were offset by investment losses. The investment losses are recognized over five years, and the experience gains are recognized over the average remaining service life, which is three years. Unrecognized amounts are reported as deferred inflows and deferred outflows. As of the end of the reporting year, the System and its participating employers would report a Net Pension Liability of \$169,188,149, Deferred Inflows of \$10,104,493, and Deferred Outflows of \$3,638,353. Consequently, the net impact on the aggregate of participating employers' Statements of Net Position due to the Employees Retirement System of the City of St. Louis would be \$175,654,289 at the end of the

**EMPLOYEES RETIREMENT SYSTEM OF THE CITY OF ST. LOUIS  
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**SECTION I - BOARD SUMMARY**

measurement year. In addition, any contributions between the measurement date and each individual employer's reporting date would be reported as deferred outflows to offset the cash outflow reported.

For the measurement year ending September 30, 2018, the collective annual pension expense is \$29,075,975 or 12.12% of covered-employee payroll. This amount is not related to participating employers' contributions to the System (\$29,361,102), but instead represents the change in the net impact on participating employer's Statements of Net Position plus employer contributions (\$175,654,289 – \$175,939,416 + \$29,361,102). The collective pension expense is smaller than the collective expense for the prior year. Volatility in pension expense from year to year is to be expected. It will largely be driven by investment gains or losses, but other changes can also have a significant impact. A breakdown of the components of the net pension expense is shown in the report.

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**SECTION II - CERTIFICATION**

The purpose of this report is to provide accounting and financial reporting information under GASB 67 for the Employees Retirement System of the City of St. Louis and under GASB 68 for the employers that participate in the System. This report is for the use of the System, the participating employers and their auditors in preparing financial reports in accordance with applicable law and accounting requirements. This report is not appropriate for other purposes, including the measurement of funding requirements for the Employees Retirement System of the City of St. Louis and estimating the price to settle the System's obligations.


In preparing our report, we relied on information (some oral and some written) supplied by the Employees Retirement System of the City of St. Louis. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23.

Future actuarial measurements may differ significantly from the current measurements due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law.

To the best of our knowledge, this report and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices that are consistent with the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board. Furthermore, as credentialed actuaries, we meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this report. This report does not address any contractual or legal issues. We are not attorneys, and our firm does not provide any legal services or advice.

This report was prepared for the Employees Retirement System of the City of St. Louis for the purposes described herein and for the use by the plan auditor in completing an audit related to the matters herein. Other users of this report are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

  
Stephen T. McElhaney, FSA, FCA, EA  
Principal Consulting Actuary

  
Michael J. Noble, FSA, FCA, EA  
Principal Consulting Actuary

**EMPLOYEES RETIREMENT SYSTEM OF THE CITY OF ST. LOUIS  
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**SECTION III - DETERMINATION OF DISCOUNT RATE**

The discount rate used to measure the Total Pension Liability was 7.50%. This discount rate is intended to be used for accounting and financial reporting, but is not appropriate for estimating the price to settle the plan's liability.

The System's Fiduciary Net Position is projected, based on the methods outlined in paragraphs 41-43 of GASB 67, to be sufficient to make all projected benefit payments for the current members when due. Therefore, the long-term expected rate of return on the System's investments (i.e., 7.50%) was applied to all periods of projected benefit payments to determine the Total Pension Liability (TPL). Details of this determination can be found in Appendix D.

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**SECTION IV – GASB 67 REPORTING INFORMATION**

**Note Disclosures**

The table below shows the changes in the Total Pension Liability, the Plan Fiduciary Net Position (i.e., fair value of system assets), and the Net Pension Liability during the measurement year.

<b>Table IV-1 Change in Collective Net Pension Liability</b>			
	Increase (Decrease)		
	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)
<b>Balances at 9/30/2017</b>	\$ 990,630,355	\$ 816,915,650	\$ 173,714,705
<b>Changes for the year:</b>			
Service cost	13,342,936		13,342,936
Interest	72,329,296		72,329,296
Changes of benefits	0		0
Differences between expected and actual experience	(12,970,671)		(12,970,671)
Changes of assumptions	0		0
Contributions - employer		29,361,102	(29,361,102)
Contributions - member		58,201	(58,201)
Net investment income		48,770,991	(48,770,991)
Benefit payments	(66,788,634)	(66,788,634)	0
Administrative expense		(962,177)	962,177
<b>Net changes</b>	<u>5,912,927</u>	<u>10,439,483</u>	<u>(4,526,556)</u>
<b>Balances at 9/30/2018</b>	<u>\$ 996,543,282</u>	<u>\$ 827,355,133</u>	<u>\$ 169,188,149</u>

During the measurement year, the collective NPL decreased by approximately \$4.5 million. The service cost and interest cost increased the collective NPL by approximately \$85.7 million while contributions plus investment gains offset by administrative expenses decreased the collective NPL by approximately \$77.2 million. There was an actuarial experience gain of approximately \$13.0 million.

There were no changes in benefits or assumptions during the year.



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**SECTION IV – GASB 67 REPORTING INFORMATION**

Changes in the discount rate affect the measurement of the TPL. Lower discount rates produce a higher TPL and higher discount rates produce a lower TPL. Because the discount rate does not affect the measurement of assets, the percentage change in the NPL can be very significant for a relatively small change in the discount rate. The table below page shows the sensitivity of the collective NPL to the discount rate.

<b>Table IV-2</b>			
<b>Sensitivity of Collective Net Pension Liability to Changes in Discount Rate</b>			
	<b>1% Decrease 6.50%</b>	<b>Discount Rate 7.50%</b>	<b>1% Increase 8.50%</b>
Total Pension Liability	\$ 1,094,941,170	\$ 996,543,282	\$ 912,320,738
Plan Fiduciary Net Position	<u>827,355,133</u>	<u>827,355,133</u>	<u>827,355,133</u>
Collective Net Pension Liability	<u>\$ 267,586,037</u>	<u>\$ 169,188,149</u>	<u>\$ 84,965,605</u>
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	75.6%	83.0%	90.7%

A one percent decrease in the discount rate increases the TPL by approximately 10% and increases the collective NPL by approximately 58%. A one percent increase in the discount rate decreases the TPL by approximately 8% and decreases the collective NPL by approximately 50%.

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**SECTION IV – GASB 67 REPORTING INFORMATION**

**Required Supplementary Information**

The schedules of Required Supplementary Information generally start with information as of the implementation of GASB 67, and eventually will build up to 10 years of information. The schedule below shows the changes in collective NPL and related ratios required by GASB for the five years since implementation.

Table IV-3 Schedule of Changes in Collective Net Pension Liability and Related Ratios					
	FYE 2018	FYE 2017	FYE 2016	FYE 2015	FYE 2014
<b><u>Total Pension Liability</u></b>					
Service cost (MOY)	\$ 13,342,936	\$ 13,185,412	\$ 13,703,072	\$ 13,067,553	\$ 10,591,910
Interest (includes interest on service cost)	72,329,296	71,206,835	69,893,488	73,825,307	72,012,146
Changes of benefit terms	0	0	0	0	0
Differences between expected and actual experience	(12,970,671)	(4,372,137)	(3,601,576)	(2,701,109)	(3,664,735)
Changes of assumptions	0	0	0	(5,107,330)	0
Benefit payments, including refunds of member contributions	(66,788,634)	(63,532,834)	(60,972,546)	(59,065,812)	(56,317,073)
<b>Net change in total pension liability</b>	<b>\$ 5,912,927</b>	<b>\$ 16,487,276</b>	<b>\$ 19,022,438</b>	<b>\$ 20,018,609</b>	<b>\$ 22,622,248</b>
<b>Total pension liability - beginning</b>	<b>990,630,355</b>	<b>974,143,079</b>	<b>955,120,641</b>	<b>935,102,032</b>	<b>912,479,784</b>
<b>Total pension liability - ending</b>	<b>\$ 996,543,282</b>	<b>\$ 990,630,355</b>	<b>\$ 974,143,079</b>	<b>\$ 955,120,641</b>	<b>\$ 935,102,032</b>
<b><u>Plan fiduciary net position</u></b>					
Contributions - employer	\$ 29,361,102	\$ 29,782,200	\$ 32,127,591	\$ 35,436,141	\$ 36,788,260
Contributions - member	58,201	134,248	10,093	289,810	129,164
Net investment income	48,770,991	86,394,236	66,460,934	(28,435,882)	70,076,027
Benefit payments, including refunds of member contributions	(66,788,634)	(63,532,834)	(60,972,546)	(59,065,812)	(56,317,073)
Administrative expense	(962,177)	(763,273)	(722,132)	(722,758)	(670,957)
<b>Net change in plan fiduciary net position</b>	<b>\$ 10,439,483</b>	<b>\$ 52,014,577</b>	<b>\$ 36,903,940</b>	<b>\$ (52,498,501)</b>	<b>\$ 50,005,421</b>
<b>Plan fiduciary net position - beginning</b>	<b>816,915,650</b>	<b>764,901,073</b>	<b>727,997,133</b>	<b>780,495,634</b>	<b>730,490,213</b>
<b>Plan fiduciary net position - ending</b>	<b>\$ 827,355,133</b>	<b>\$ 816,915,650</b>	<b>\$ 764,901,073</b>	<b>\$ 727,997,133</b>	<b>\$ 780,495,634</b>
<b>Net pension liability - ending</b>	<b>\$ 169,188,149</b>	<b>\$ 173,714,705</b>	<b>\$ 209,242,006</b>	<b>\$ 227,123,508</b>	<b>\$ 154,606,398</b>
<b>Plan fiduciary net position as a percentage of the total pension liability</b>	83.02%	82.46%	78.52%	76.22%	83.47%
<b>Covered payroll</b>	\$ 239,956,558	\$ 239,583,848	\$ 237,354,364	\$ 238,385,100	\$ 237,794,875
<b>Net pension liability as a percentage of covered payroll</b>	70.51%	72.51%	88.16%	95.28%	65.02%

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**SECTION IV – GASB 67 REPORTING INFORMATION**

Because an Actuarially Determined Contribution (ADC) has been calculated, the following schedule is required.

**Table IV-4  
 Schedule of Collective Employer Contributions**

	FYE 2018	FYE 2017	FYE 2016	FYE 2015	FYE 2014
Actuarially Determined Contribution	\$ 28,061,249	\$ 27,684,090	\$ 28,534,042	\$ 31,605,493	\$ 34,060,798
Contributions in Relation to the Actuarially Determined Contribution	29,361,102	29,782,200	32,127,591	35,436,141	36,788,260
Contribution Deficiency/(Excess)	<u>\$ (1,299,853)</u>	<u>\$ (2,098,110)</u>	<u>\$ (3,593,549)</u>	<u>\$ (3,830,648)</u>	<u>\$ (2,727,462)</u>
Covered Payroll	\$ 239,956,558	\$ 239,583,848	\$ 237,354,364	\$ 238,385,100	\$ 237,794,875
Contributions as a Percentage of Covered Payroll	12.24%	12.43%	13.54%	14.87%	15.47%

The notes below summarize the key methods and assumptions used to determine the ADC for FYE 2018.

**Notes to Schedule**

Valuation Date	October 1, 2017
Timing	Actuarially determined contribution rates are calculated based on the actuarial valuation at the beginning of the plan year
<b><u>Key Methods and Assumptions Used to Determine Contribution Rates:</u></b>	
Actuarial cost method	Entry Age Normal Cost Method
Asset valuation method	Five year smoothing
Amortization method	Fixed 20 year period as of October 1, 2015 as a level percentage of payroll.
	Future gains and losses and changes in actuarial assumptions will be amortized in layers over separate 20 year periods.
Discount rate	7.50%
Amortization growth rate	3.00%
Price inflation	2.50%
Salary increases	3.00% plus merit component based on years of service
Mortality	RP-2000 Healthy Mortality with 3 year set-forward with generational projections using Scale AA

A complete description of the methods and assumptions used to determine contribution rates for the year ending September 30, 2018 can be found in the October 1, 2017 actuarial valuation report.

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**SECTION V – GASB 68 COLLECTIVE AMOUNTS**

The participating employers were not required to implement GASB 68 until their reporting dates for their first fiscal year that ends after June 15, 2015. We understand that employers with fiscal years ending June 30 or September 30 based their initial disclosures on the September 30, 2014 measurement date. However, employers with fiscal years ending December 31 based their initial disclosures on the September 30, 2015 measurement date. The schedules in this section will be used by employers for fiscal years ending December 31, 2018, June 30, 2019, and September 30, 2019.

Because the Employees Retirement System of the City of St. Louis is a cost-sharing multiple-employer pension plan, each employer participating in the System must reflect a portion of the collective Net Pension Liability, Pension Expense, and Deferred Outflows and Inflows in their financial statements. This section develops the collective amounts that are allocated to participating employers.

The impact of experience gains or losses and assumption changes on the TPL are recognized in expense over the average expected remaining service life of all active and inactive members of the System. As of the measurement date, this recognition period was three years.

During the year, there was an experience gain of approximately \$13.0 million. Approximately \$4.3 million of that gain was recognized as a reduction in collective pension expense in the current year and an identical amount will be recognized in each of the next two years, resulting in a collective deferred inflow of resources as of September 30, 2018 of approximately \$8.6 million. Unrecognized experience gains from prior periods were approximately \$4.1 million of which \$2.7 million was recognized as a decrease in collective pension expense in the current year. The combination of unrecognized experience gains this year and unrecognized experience gains from prior periods results in a collective deferred inflow of resources as of September 30, 2018 to be approximately \$10.1 million.

There are no unrecognized gains or losses due to assumption changes as of September 30, 2018.

The impact of investment gains or losses is recognized over a period of five years. During the measurement year, there was an investment loss of approximately \$11.1 million. Approximately \$2.2 million of that loss was recognized in the current year and an identical amount will be recognized in each of the next four years. Unrecognized investment losses from prior periods were approximately \$1.9 million of which \$7.1 million was recognized as an increase in collective pension expense in the current year. The combination of unrecognized investment losses this year and unrecognized net investment losses from prior periods results in a collective deferred outflow of resources as of September 30, 2018 to be approximately \$3.6 million.

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**SECTION V – GASB 68 COLLECTIVE AMOUNTS**

The table below summarizes the current balances of collective deferred outflows and deferred inflows of resources along with the net recognition over the next five years.

**Table V-1  
Schedule of Collective Deferred Inflows and Outflows of Resources**

	<b>Deferred Outflows of Resources</b>	<b>Deferred Inflows of Resources</b>												
Differences between expected and actual experience	\$ 0	\$ 10,104,493												
Changes in assumptions	0	0												
Net difference between projected and actual earnings on pension plan investments	<u>3,638,353</u>	<u>0</u>												
<b>Total</b>	<b><u>\$ 3,638,353</u></b>	<b><u>\$10,104,493</u></b>												
<p>Amounts reported as deferred outflows and deferred inflows of resources will be recognized in pension expense as follows:</p> <p align="center"><b>Measurement year ended June 30:</b></p> <table> <tr> <td>2019</td> <td align="right">5,912,608</td> </tr> <tr> <td>2020</td> <td align="right">(10,754,726)</td> </tr> <tr> <td>2021</td> <td align="right">(3,841,271)</td> </tr> <tr> <td>2022</td> <td align="right">2,217,249</td> </tr> <tr> <td>2023</td> <td align="right">0</td> </tr> <tr> <td>Thereafter</td> <td align="right">\$ 0</td> </tr> </table>			2019	5,912,608	2020	(10,754,726)	2021	(3,841,271)	2022	2,217,249	2023	0	Thereafter	\$ 0
2019	5,912,608													
2020	(10,754,726)													
2021	(3,841,271)													
2022	2,217,249													
2023	0													
Thereafter	\$ 0													

The collective annual pension expense recognized by the participating employers can be calculated two different ways. First, it is the change in the amounts reported on the participating employers' Statements of Net Position that relate to the System and are not attributable to employer contributions. That is, it is the change in collective NPL plus the changes in collective deferred outflows and inflows plus participating employer contributions.

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**SECTION V – GASB 68 COLLECTIVE AMOUNTS**

Alternatively, annual pension expense can be calculated by its individual components. While GASB does not require or suggest the organization of the individual components shown in the table below, we believe it helps to understand the level and volatility of the collective pension expense.

<b>Table V-2 Calculation of Collective Pension Expense</b>		
	<b>Measurement Year Ending</b>	
	<b>2018</b>	<b>2017</b>
Change in Net Pension Liability	\$ (4,526,556)	\$ (35,527,301)
Change in Deferred Outflows	(1,747,780)	37,413,797
Change in Deferred Inflows	5,989,209	(1,804,762)
Employer Contributions	<u>29,361,102</u>	<u>29,782,200</u>
<b>Pension Expense</b>	<b>\$ 29,075,975</b>	<b>\$ 29,863,934</b>
<b>Pension Expense as % of Payroll</b>	<b>12.12%</b>	<b>12.46%</b>
<b>Operating Expenses</b>		
Service cost	\$ 13,342,936	\$ 13,185,412
Employee contributions	(58,201)	(134,248)
Administrative expenses	<u>962,177</u>	<u>763,273</u>
Total	\$ 14,246,912	\$ 13,814,437
<b>Financing Expenses</b>		
Interest cost	\$ 72,329,296	\$ 71,206,835
Expected return on assets	<u>(59,857,228)</u>	<u>(56,101,650)</u>
Total	\$ 12,472,068	\$ 15,105,185
<b>Changes</b>		
Benefit changes	\$ 0	\$ 0
Recognition of assumption changes	0	(1,702,443)
Recognition of liability gains and losses	(6,981,462)	(4,474,456)
Recognition of investment gains and losses	<u>9,338,457</u>	<u>7,121,211</u>
Total	\$ 2,356,995	\$ 944,312
<b>Pension Expense</b>	<b>\$ 29,075,975</b>	<b>\$ 29,863,934</b>

First, there are components referred to as operating expenses. These are items directly attributable to the operation of the plan during the measurement year. Service cost less employee contributions represents the increase in employer-provided benefits attributable to the year, and administrative expenses are the cost of operating the System for the year.

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**SECTION V – GASB 68 COLLECTIVE AMOUNTS**

Second, there are the financing expenses: the interest on the Total Pension Liability less the expected return on assets. Since the discount rate is equal to the long-term expected return on assets, the financing expense is just the interest on the Net Pension Liability.

The final category is changes. This category will drive most of the volatility in pension expense from year to year. It includes any changes in benefits made during the year and the recognized amounts due to assumption changes, gains or losses on the TPL, and investment gains or losses. The total collective pension expense decreased by about \$0.8 million. There were no changes to either benefits or assumptions for the year.

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**SECTION VI – GASB 68 REPORTING INFORMATION FOR PARTICIPATING  
EMPLOYERS**

**Proportionate Shares**

GASB 68 requires that the proportionate share for each employer be determined based on the “employer’s projected long-term contribution effort to the pension ... as compared to the total projected long-term contribution effort of all employers ...” Although not required as part of the System’s GASB 67 reporting requirements, the System is following the advice of the AICPA<sup>1</sup> and making a determination of each employer’s proportionate share, which will be reviewed by the System’s auditor.

Proportionate shares for each participating employer are determined based on the ratio of each participating employer’s actual contribution to the System during the measurement year to the sum of the actual contributions for all participating employers. The table below shows the actual employer contributions and proportionate shares for each participating employer for the current and prior measurement years.

<b>Table VI-1 Determination of Employers' Proportionate Share</b>				
<b>Employer</b>	<b>September 30, 2018</b>		<b>September 30, 2017</b>	
	<b>Employer Contribution</b>	<b>Proportionate Share</b>	<b>Employer Contribution</b>	<b>Proportionate Share</b>
CITY	\$ 19,405,135	66.09130%	\$ 19,870,792	66.72036%
FIREMEN'S RETIREMENT SYSTEM	38,116	0.12982%	38,208	0.12829%
POLICE RETIREMENT SYSTEM	47,637	0.16225%	42,519	0.14277%
PARKING METERS	462,073	1.57376%	449,605	1.50964%
AIRPORT	2,555,369	8.70325%	2,628,699	8.82641%
WATER	1,665,985	5.67412%	1,742,282	5.85008%
ZOO	2,349,658	8.00262%	2,303,941	7.73597%
LIBRARY	1,263,512	4.30335%	1,186,786	3.98488%
ART MUSEUM	1,321,503	4.50086%	1,252,817	4.20660%
MENTAL HEALTH BOARD	84,457	0.28765%	86,193	0.28941%
TOWER GROVE PARK	139,935	0.47660%	136,260	0.45752%
TAXICAB COMMISSION	13,276	0.04522%	29,953	0.10057%
FIREFIGHTERS' RETIREMENT PLAN	14,446	0.04920%	14,145	0.04749%
<b>Total</b>	<b>\$ 29,361,102</b>	<b>100.00000%</b>	<b>\$ 29,782,200</b>	<b>100.00000%</b>

<sup>1</sup>[http://www.aicpa.org/interestareas/governmentauditquality/resources/gasbmatters/downloadabledocuments/aicpalgep\\_cs\\_er\\_reporting\\_whitepaper.pdf](http://www.aicpa.org/interestareas/governmentauditquality/resources/gasbmatters/downloadabledocuments/aicpalgep_cs_er_reporting_whitepaper.pdf)



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The table below shows the proportionate share of the collective NPL (under three discount rates), the collective deferred outflows, the collective deferred inflows, and the collective pension expense allocated to each participating employer as of September 30, 2018.

**Table VI-2  
Schedule of Employers' Proportionate Share of Collective Amounts at September 30, 2018**

Employer	Proportionate Share	Share of NPL @ 6.50%	Share of NPL @ 7.50%	Share of NPL @ 8.50%	Share of Deferred Outflows	Share of Deferred Inflows	Pension Expense
CITY	66.09130%	\$ 176,851,100	\$ 111,818,653	\$ 56,154,876	\$ 2,404,635	\$ 6,678,191	\$ 19,216,691
FIREMEN'S RETIREMENT SYSTEM	0.12982%	347,375	219,637	110,301	4,723	13,117	37,746
POLICE RETIREMENT SYSTEM	0.16225%	434,146	274,500	137,853	5,903	16,394	47,174
PARKING METERS	1.57376%	4,211,159	2,662,614	1,337,154	57,259	159,020	457,586
AIRPORT	8.70325%	23,288,672	14,724,861	7,394,766	316,655	879,419	2,530,554
WATER	5.67412%	15,183,160	9,599,943	4,821,053	206,445	573,341	1,649,807
ZOO	8.00262%	21,413,899	13,539,488	6,799,476	291,164	808,624	2,326,840
LIBRARY	4.30335%	11,515,173	7,280,764	3,656,370	156,571	434,832	1,251,242
ART MUSEUM	4.50086%	12,043,681	7,614,927	3,824,186	163,757	454,789	1,308,670
MENTAL HEALTH BOARD	0.28765%	769,709	486,669	244,403	10,466	29,066	83,637
TOWER GROVE PARK	0.47660%	1,275,315	806,351	404,946	17,340	48,158	138,576
TAXICAB COMMISSION	0.04522%	120,992	76,501	38,418	1,645	4,569	13,147
FIREFIGHTERS' RETIREMENT PLAN	0.04920%	131,655	83,243	41,804	1,790	4,972	14,306
<b>Total</b>	<b>100.00000%</b>	<b>\$ 267,586,037</b>	<b>\$ 169,188,149</b>	<b>\$ 84,965,605</b>	<b>\$ 3,638,353</b>	<b>\$ 10,104,493</b>	<b>\$ 29,075,975</b>

The proportionate share allocated to each individual employer will change on each measurement date. The net effect of the change in proportion on the share of the collective NPL, collective deferred outflows and collective deferred inflows allocated to each employer becomes a deferred outflow or inflow for that employer and is recognized over the average future working life of the System's active and inactive members (three years).

Similarly, the difference between each employer's actual contributions and the employer's proportionate share of collective employer contributions becomes a deferred outflow or inflow for that employer and is recognized over the average future working life of the System's active and inactive members (three years). Because proportionate shares are determined based on each employer's actual

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contributions, there is no difference between the actual contributions and the proportionate share of collective contributions for each employer.

The table below shows the change in proportion and the impact of that change in proportion on the proportionate share of the collective NPL, collective deferred outflows, and collective deferred inflows. It also shows any contribution differences.

Table VI-3 Schedule of Employers' Changes in Proportion and Contribution Differences									
Employer	Proportionate Shares		Impact of Change in Proportion				Contributions		
	9/30/2017	9/30/2018	Net Pension Liability	Deferred Outflows	Deferred Inflows	Net Effect	Actual	Proportionate Share	Difference
CITY	66.72036%	66.09130%	\$ (1,092,769)	\$ (11,893)	\$ 25,888	\$ (1,106,764)	\$ 19,405,135	\$ 19,405,135	\$ 0
FIREMEN'S RETIREMENT SYSTEM	0.12829%	0.12982%	2,652	29	(63)	2,686	38,116	38,116	0
POLICE RETIREMENT SYSTEM	0.14277%	0.16225%	33,838	368	(802)	34,272	47,637	47,637	0
PARKING METERS	1.50964%	1.57376%	111,378	1,212	(2,639)	112,805	462,073	462,073	0
AIRPORT	8.82641%	8.70325%	(213,953)	(2,328)	5,069	(216,694)	2,555,369	2,555,369	0
WATER	5.85008%	5.67412%	(305,660)	(3,327)	7,241	(309,574)	1,665,985	1,665,985	0
ZOO	7.73597%	8.00262%	463,220	5,041	(10,974)	469,153	2,349,658	2,349,658	0
LIBRARY	3.98488%	4.30335%	553,229	6,021	(13,106)	560,314	1,263,512	1,263,512	0
ART MUSEUM	4.20660%	4.50086%	511,184	5,562	(12,110)	517,732	1,321,503	1,321,503	0
MENTAL HEALTH BOARD	0.28941%	0.28765%	(3,061)	(33)	73	(3,101)	84,457	84,457	0
TOWER GROVE PARK	0.45752%	0.47660%	33,142	361	(785)	33,566	139,935	139,935	0
TAXICAB COMMISSION	0.10057%	0.04522%	(96,164)	(1,047)	2,278	(97,395)	13,276	13,276	0
FIREFIGHTERS' RETIREMENT PLAN	0.04749%	0.04920%	2,964	32	(70)	3,002	14,446	14,446	0
<b>Total</b>	<b>100.00000%</b>	<b>100.00000%</b>	<b>\$ 0</b>	<b>\$ (2)</b>	<b>\$ 0</b>	<b>\$ 2</b>	<b>\$ 29,361,102</b>	<b>\$ 29,361,102</b>	<b>\$ 0</b>

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The table below shows the reconciliation of deferred outflows and inflows due to proportion changes for each participating employer from the prior measurement date to the current measurement date.

Table VI-4 Reconciliation of Deferred Outflows and Inflows Due to Proportion Change									
Employer	Deferred Outflows				Deferred Inflows				
	Current Year		Recognition	9/30/2018	Current Year		Recognition	9/30/2018	
	9/30/2017	Net Effect			9/30/2017	Net Effect			
CITY	\$ 0	\$ 0	\$ 0	\$ 0	\$ (318,787)	\$ (1,106,764)	\$ (655,234)	\$ (770,317)	
FIREMEN'S RETIREMENT SYSTEM	10,077	2,686	9,959	2,804	0	0	0	0	
POLICE RETIREMENT SYSTEM	7,925	34,272	19,349	22,848	(19,521)	0	(9,761)	(9,760)	
PARKING METERS	0	112,805	37,602	75,203	(26,322)	0	(23,269)	(3,053)	
AIRPORT	19,890	0	19,890	0	(122,254)	(216,694)	(133,358)	(205,590)	
WATER	82,774	0	82,774	0	(165,386)	(309,574)	(185,884)	(289,076)	
ZOO	254,116	469,153	321,976	401,293	0	0	0	0	
LIBRARY	0	560,314	186,771	373,543	(153,492)	0	(112,417)	(41,075)	
ART MUSEUM	384,482	517,732	408,897	493,317	0	0	0	0	
MENTAL HEALTH BOARD	18,927	0	13,993	4,934	0	(3,101)	(1,034)	(2,067)	
TOWER GROVE PARK	43,611	33,566	54,580	22,597	0	0	0	0	
TAXICAB COMMISSION	2,250	0	2,250	0	(29,679)	(97,395)	(47,305)	(79,769)	
FIREFIGHTERS' RETIREMENT PLAN	11,389	3,002	10,221	4,170	0	0	0	0	
<b>Total</b>	<b>\$ 835,441</b>	<b>\$ 1,733,529</b>	<b>\$ 1,168,261</b>	<b>\$ 1,400,709</b>	<b>\$ (835,441)</b>	<b>\$ (1,733,528)</b>	<b>\$ (1,168,262)</b>	<b>\$ (1,400,707)</b>	

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The table below summarizes the deferred outflows allocated to each employer for experience, assumption changes, investment returns, proportion changes and contribution differences.

Table VI-5 Schedule of Employers' Deferred Outflows at September 30, 2018						
Employer	Proportionate Shares	Experience	Assumption Changes	Investment Return	Proportion Change	Contribution Difference
CITY	66.09130%	\$ 0	\$ 0	\$ 2,404,635	\$ 0	\$ 0
FIREMEN'S RETIREMENT SYSTEM	0.12982%	0	0	4,723	2,804	0
POLICE RETIREMENT SYSTEM	0.16225%	0	0	5,903	22,848	0
PARKING METERS	1.57376%	0	0	57,259	75,203	0
AIRPORT	8.70325%	0	0	316,655	0	0
WATER	5.67412%	0	0	206,445	0	0
ZOO	8.00262%	0	0	291,164	401,293	0
LIBRARY	4.30335%	0	0	156,571	373,543	0
ART MUSEUM	4.50086%	0	0	163,757	493,317	0
MENTAL HEALTH BOARD	0.28765%	0	0	10,466	4,934	0
TOWER GROVE PARK	0.47660%	0	0	17,340	22,597	0
TAXICAB COMMISSION	0.04522%	0	0	1,645	0	0
FIREFIGHTERS' RETIREMENT PLAN	0.04920%	0	0	1,790	4,170	0
<b>Total</b>	<b>100.00000%</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 3,638,353</b>	<b>\$ 1,400,709</b>	<b>\$ 0</b>

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The table below summarizes the deferred inflows allocated to each employer for experience, assumption changes, investment returns, proportion changes and contribution differences.

Table VI-6 Schedule of Employers' Deferred Inflows at September 30, 2018						
Employer	Proportionate Shares	Experience	Assumption Changes	Investment Return	Proportion Change	Contribution Difference
CITY	66.09130%	\$ 6,678,191	\$ 0	\$ 0	\$ 770,317	\$ 0
FIREMEN'S RETIREMENT SYSTEM	0.12982%	13,117	0	0	0	0
POLICE RETIREMENT SYSTEM	0.16225%	16,394	0	0	9,760	0
PARKING METERS	1.57376%	159,020	0	0	3,053	0
AIRPORT	8.70325%	879,419	0	0	205,590	0
WATER	5.67412%	573,341	0	0	289,076	0
ZOO	8.00262%	808,624	0	0	0	0
LIBRARY	4.30335%	434,832	0	0	41,075	0
ART MUSEUM	4.50086%	454,789	0	0	0	0
MENTAL HEALTH BOARD	0.28765%	29,066	0	0	2,067	0
TOWER GROVE PARK	0.47660%	48,158	0	0	0	0
TAXICAB COMMISSION	0.04522%	4,569	0	0	79,769	0
FIREFIGHTERS' RETIREMENT PLAN	0.04920%	4,972	0	0	0	0
<b>Total</b>	<b>100.00000%</b>	<b>\$ 10,104,493</b>	<b>\$ 0</b>	<b>\$ 0</b>	<b>\$ 1,400,707</b>	<b>\$ 0</b>

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The table below shows the net amount of deferred outflows and inflows to be recognized by each participating employer in each of the next five years and the total thereafter.

<b>Table VI-7</b>						
<b>Schedule of Employers' Recognition of Deferred Outflows and Inflows at September 30, 2018</b>						
<b>Employer</b>	<b>Recognition for Measurement Year Ending</b>					
	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>Thereafter</b>
CITY	\$ 3,506,325	\$ (7,476,860)	\$ (2,538,746)	\$ 1,465,409	\$ 0	\$ 0
FIREMEN'S RETIREMENT SYSTEM	9,584	(13,066)	(4,987)	2,878	0	0
POLICE RETIREMENT SYSTEM	11,257	(6,025)	(6,232)	3,597	0	0
PARKING METERS	127,599	(131,653)	(60,452)	34,894	0	0
AIRPORT	381,230	(1,008,242)	(334,315)	192,973	0	0
WATER	149,604	(713,428)	(217,958)	125,809	0	0
ZOO	718,072	(704,275)	(307,402)	177,438	0	0
LIBRARY	400,136	(276,042)	(165,303)	95,416	0	0
ART MUSEUM	586,857	(311,478)	(172,890)	99,795	0	0
MENTAL HEALTH BOARD	20,908	(31,968)	(11,049)	6,378	0	0
TOWER GROVE PARK	39,589	(40,069)	(18,307)	10,567	0	0
TAXICAB COMMISSION	(44,630)	(37,328)	(1,737)	1,003	0	0
FIREFIIGHTERS' RETIREMENT PLAN	6,079	(4,291)	(1,890)	1,091	0	0
<b>Total</b>	<b>\$ 5,912,611</b>	<b>\$ (10,754,726)</b>	<b>\$ (3,841,271)</b>	<b>\$ 2,217,249</b>	<b>\$ 0</b>	<b>\$ 0</b>

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The table below shows the calculation of the pension expense for each participating employer. The calculation is shown first as the sum of the proportionate share of the collective pension expense and the amounts recognized for proportion changes and contribution differences. The right side of the table shows the calculation as the sum of the changes in NPL and deferred amounts not attributable to contributions.

Table VI-8 Schedule of Employers' Pension Expense for the Measurement Year Ending September 30, 2018										
Employer	Collective		Contribution Difference	Employer Pension Expense	Change in Employer			Employer Contributions	Employer Pension Expense	
	Pension Expense	Change in Proportion			Net Pension Liability	Deferred Outflows	Deferred Inflows			
CITY	\$ 19,216,691	\$ (655,234)	\$ 0	\$ 18,561,457	\$ (4,084,429)	\$ (1,143,238)	\$ 4,383,989	\$ 19,405,135	\$ 18,561,457	
FIREMEN'S RETIREMENT SYSTEM	37,746	\$ 9,959	0	\$ 47,704	(3,224)	4,975	7,838	38,116	47,705	
POLICE RETIREMENT SYSTEM	47,174	\$ 9,588	0	\$ 56,762	26,493	(18,127)	758	47,637	56,761	
PARKING METERS	457,586	\$ 14,333	0	\$ 471,919	40,141	(103,921)	73,625	462,073	471,919	
AIRPORT	2,530,554	\$ (113,469)	0	\$ 2,417,085	(607,910)	(129,895)	599,523	2,555,369	2,417,086	
WATER	1,649,807	\$ (103,110)	0	\$ 1,546,697	(562,503)	(13,071)	456,284	1,665,985	1,546,696	
ZOO	2,326,840	\$ 321,976	0	\$ 2,648,816	100,977	(292,086)	490,267	2,349,658	2,648,816	
LIBRARY	1,251,242	\$ 74,354	0	\$ 1,325,596	358,435	(454,777)	158,426	1,263,512	1,325,597	
ART MUSEUM	1,308,670	\$ 408,897	0	\$ 1,717,567	307,450	(193,064)	281,676	1,321,503	1,717,566	
MENTAL HEALTH BOARD	83,637	\$ 12,958	0	\$ 96,595	(16,081)	8,998	19,222	84,457	96,596	
TOWER GROVE PARK	138,576	\$ 54,580	0	\$ 193,156	11,568	12,323	29,330	139,935	193,156	
TAXICAB COMMISSION	13,147	\$ (45,055)	0	\$ (31,908)	(98,210)	2,506	50,520	13,276	(31,908)	
FIREFIGHTERS' RETIREMENT PLAN	14,306	\$ 10,221	0	\$ 24,527	737	6,327	3,017	14,446	24,527	
<b>Total</b>	<b>\$ 29,075,975</b>	<b>\$ (1)</b>	<b>\$ 0</b>	<b>\$ 29,075,974</b>	<b>\$ (4,526,556)</b>	<b>\$ (2,313,048)</b>	<b>\$ 6,554,475</b>	<b>\$ 29,361,102</b>	<b>\$ 29,075,973</b>	

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The table below summarizes the information needed for each employer's schedules of required supplementary information.

Table VI-9 Schedule of Employers' RSI Information at September 30, 2018									
Employer	Proportionate Shares	Proportionate Share of NPL	Covered-Employee Payroll	Share of NPL as a % of Payroll	Plan Fiduciary Net Position as % of TPL	Contractually Required Contribution	Actual Contributions	Contribution Deficiency	
CITY	66.09130%	\$ 111,818,653	\$ 158,388,201	70.6%	83.0%	\$ 19,405,135	\$ 19,405,135	\$ 0	
FIREMEN'S RETIREMENT SYSTEM	0.12982%	219,637	311,088	70.6%	83.0%	38,116	38,116	0	
POLICE RETIREMENT SYSTEM	0.16225%	274,500	388,771	70.6%	83.0%	47,637	47,637	0	
PARKING METERS	1.57376%	2,662,614	3,771,356	70.6%	83.0%	462,073	462,073	0	
AIRPORT	8.70325%	14,724,861	20,856,740	70.6%	83.0%	2,555,369	2,555,369	0	
WATER	5.67412%	9,599,943	13,598,071	70.6%	83.0%	1,665,985	1,665,985	0	
ZOO	8.00262%	13,539,488	19,319,335	70.1%	83.0%	2,349,658	2,349,658	0	
LIBRARY	4.30335%	7,280,764	10,386,393	70.1%	83.0%	1,263,512	1,263,512	0	
ART MUSEUM	4.50086%	7,614,927	10,865,298	70.1%	83.0%	1,321,503	1,321,503	0	
MENTAL HEALTH BOARD	0.28765%	486,669	693,975	70.1%	83.0%	84,457	84,457	0	
TOWER GROVE PARK	0.47660%	806,351	1,150,269	70.1%	83.0%	139,935	139,935	0	
TAXICAB COMMISSION	0.04522%	76,501	109,183	70.1%	83.0%	13,276	13,276	0	
FIREFIGHTERS' RETIREMENT PLAN	0.04920%	83,243	117,877	70.6%	83.0%	14,446	14,446	0	
<b>Total</b>	<b>100.00000%</b>	<b>\$ 169,188,149</b>	<b>\$ 239,956,558</b>	<b>70.5%</b>	<b>83.0%</b>	<b>\$ 29,361,102</b>	<b>\$ 29,361,102</b>	<b>\$ 0</b>	



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**APPENDIX A - MEMBERSHIP INFORMATION**

<b>ACTIVE MEMBER DATA</b>			
<b>Valuation as of:</b>	<b>September 30, 2017</b>	<b>September 30, 2018</b>	<b>% change</b>
<b><u>Participant Counts</u></b>			
Number	5,279	5,202	-1.5%
Average Current Age	48.5	48.6	0.1%
Average Service	12.2	12.0	-1.3%
Total Annual Salaries of Active Members	227,253,901	228,447,481	0.5%
Average Annual Salary	43,049	43,915	2.0%
DROP Members (included in Active Members)	406	391	-3.7%
Average Current Age	61.5	61.7	0.4%
Average Service	24.9	24.7	-0.8%
Total DROP Account Balances	15,653,296	15,670,204	0.1%
Average DROP Account Balances	38,555	40,077	3.9%

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Valuation as of:	NON-ACTIVE MEMBER DATA						
	Count			Average Age			
	September 30, 2017	September 30, 2018	% change	September 30, 2017	September 30, 2018	% change	
Disabled Members	192	187	-2.6%	65.8	66.2	0.6%	
Retirees	3,868	3,978	2.8%	73.3	73.2	-0.1%	
Beneficiaries	512	513	0.2%	71.9	72.3	0.6%	
Terminated Vested Members	2,499	2,512	0.5%	51.6	51.8	0.2%	
Terminated Non-Vested Members	0	0	N/A	N/A	N/A	N/A	
<b>Total</b>	<b>7,071</b>	<b>7,190</b>	<b>1.7%</b>	<b>65.3</b>	<b>65.5</b>	<b>0.2%</b>	

Valuation as of:	NON-ACTIVE MEMBER DATA						
	Annual Benefit			Average Benefit			
	September 30, 2017	September 30, 2018	% change	September 30, 2017	September 30, 2018	% change	
Disabled Members	1,628,988	1,627,186	-0.1%	8,484	8,702	2.6%	
Retirees	47,070,047	49,840,058	5.9%	12,169	12,529	3.0%	
Beneficiaries	5,506,237	5,552,490	0.8%	10,754	10,824	0.6%	
Terminated Vested Members	9,535,097	9,624,285	0.9%	3,816	3,831	0.4%	
Terminated Non-Vested Members	0	0	N/A	N/A	N/A	N/A	
<b>Total</b>	<b>63,740,369</b>	<b>66,644,019</b>	<b>4.6%</b>	<b>10,703</b>	<b>11,037</b>	<b>3.1%</b>	

Please refer to the October 1, 2018 actuarial valuation report for a more complete summary of the data.

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**APPENDIX B - ACTUARIAL ASSUMPTIONS AND METHODS**

A summary of the actuarial assumptions and methods used to calculate the Total Pension Liability as of September 30, 2018 is provided below, including any assumptions that differ from those used in the October 1, 2018 Actuarial Valuation. Please refer to the October 1, 2018 Actuarial Valuation Report for a complete description of all other assumptions.

**Key Actuarial Assumptions**

<b>Expected Return on Assets:</b>	7.50% net of investment expenses as of September 30, 2017 7.50% net of investment expenses as of September 30, 2018
<b>Municipal Bond Yield:</b>	3.64% as of September 30, 2017 4.18% as of September 30, 2018 Bond Buyer 20-Bond GO Index, September 28, 2017 and September 27, 2018
<b>Discount Rate:</b>	7.50% as of September 30, 2017 7.50% as of September 30, 2018
<b>Administrative Expenses:</b>	0.30% of payroll

**APPENDIX B - ACTUARIAL ASSUMPTIONS AND METHODS**

**Contribution Allocation Procedure**

The contribution allocation procedure primarily consists of an actuarial cost method, an asset smoothing method, and an amortization method as described below.

**1. Actuarial Cost Method**

The Entry Age actuarial cost method was used for active employees, whereby the normal cost is computed as the level annual percentage of pay required to fund the retirement benefits between each member's date of hire and assumed retirement. The actuarial liability is the difference between the present value of future benefits and the present value of future normal costs. The normal cost and actuarial liability are calculated on an individual basis. The sum of the individual amounts is the normal cost and actuarial liability for the System.

**2. Asset Valuation Method**

The market value of assets less unrecognized returns in each of the last five years, but no earlier than October 1, 2005. Initial unrecognized return is equal to the difference between the actual market return and expected market return, and is recognized over a five-year period. The actuarial value is further adjusted, if necessary, to be within 20% of the market value. The actuarial asset value was initialed at the market value as of October 1, 2005.

**3. Amortization Method**

The unfunded actuarial liability as of October 1, 2015 is amortized over a fixed 20-year period as a level percentage of payroll. Future gains and losses and changes in actuarial assumptions will be amortized in layers over separate 20-year periods.

To reflect the settlement between the Library, the Board of Trustees and the City of St. Louis, two Unfunded Accrued Liability Amortization rates are calculated. The Library, Zoo, Art Museum, Tower Grove Park, Taxicab Commission and Mental Health Board, collectively called the "Lawsuit Beneficiary Employers", have a reduced UAL Amortization rate to reflect the payments received due to the settlement as of the valuation date. First, the UAL amortization payment is determined for the combined plan (base payment). Second, the value of settlement payments made by the City are set up as gain bases and the Lawsuit Beneficiary Employers have a reduction in the contribution rate determined from the payment on these gain bases and their projected payroll. The City's UAL amortization payment is determined only on the base payment. The Lawsuit Beneficiary Employers' UAL amortization payment is the base payment minus the amortization of the gain bases that result from settlement payments.

**EMPLOYEES RETIREMENT SYSTEM OF THE CITY OF ST. LOUIS  
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**APPENDIX B - ACTUARIAL ASSUMPTIONS AND METHODS**

**4. Contributions**

The normal cost for members as of the valuation date is divided by the total salary expected to be paid during the year to determine the total normal cost rate. The unfunded actuarial liability is amortized over a fixed 20-year period as a level percentage of payroll. Future gains and losses and changes in actuarial assumptions will be amortized in layers over separate 20-year periods. An administrative expense rate of 0.30% of payroll is included in the calculation.

The total employer contribution rate is the sum of the employer normal cost rate, the administrative expense rate, and the UAL rate. The UAL payments are adjusted for interest from the valuation date to the date of expected payment in the following fiscal year.

**EMPLOYEES RETIREMENT SYSTEM OF THE CITY OF ST. LOUIS  
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**APPENDIX C - SUMMARY OF PLAN PROVISIONS**

The plan provisions are the same as those summarized in the October 1, 2018 actuarial valuation report.

**EMPLOYEES RETIREMENT SYSTEM OF THE CITY OF ST. LOUIS  
GASB 67 AND 68 REPORTING FOR SEPTEMBER 30, 2018 MEASUREMENT DATE**

**APPENDIX D – DETERMINATION OF DISCOUNT RATE**

**Table 1 - Projection of Contributions**

Projections Commence September 30, 2018

\* Total covered-employee payroll increases 3.50% per year

Year	Payroll for Current Employees (a)	Payroll for Future Employees (b)	Total Employee Payroll* (c) = (a) + (b)	EE Rate (d)	ER Rate (e)	AL Rate (f)	Employee Contributions from Current Employees (g) = (a) x (d)	Employer Contributions for Current Employees (h) = (a) x (e)	Contributions Related to Payroll of Future Employees (i) = (b) x (f)	Total Contributions (j) = (g) + (h) + (i)
1	\$ 228,447,481	\$ 0	\$ 228,447,481	0.00%	12.26%	6.16%	\$ 0	\$ 27,958,438	\$ 0	\$ 27,958,438
2	200,574,332	35,868,811	236,443,143	0.00%	12.59%	6.50%	0	25,257,101	2,330,288	27,587,389
3	178,108,141	66,610,511	244,718,653	0.00%	12.34%	6.25%	0	21,984,474	4,161,582	26,146,057
4	158,591,700	94,692,106	253,283,806	0.00%	12.19%	6.10%	0	19,339,742	5,775,254	25,114,996
5	142,509,292	119,639,447	262,148,739	0.00%	12.23%	6.14%	0	17,434,666	7,343,903	24,778,569
6	128,013,743	143,310,202	271,323,945	0.00%	12.20%	6.11%	0	15,623,312	8,754,402	24,377,714
7	115,572,595	165,247,688	280,820,283	0.00%	12.17%	6.08%	0	14,070,837	10,045,733	24,116,570
8	104,997,603	185,651,389	290,648,993	0.00%	12.15%	6.05%	0	12,752,508	11,231,592	23,984,100
9	95,731,084	205,090,623	300,821,707	0.00%	12.12%	6.02%	0	11,599,062	12,347,692	23,946,755
10	87,629,487	223,720,980	311,350,467	0.00%	12.09%	5.99%	0	10,591,962	13,404,283	23,996,245
11	80,890,090	241,357,644	322,247,734	0.00%	12.06%	5.96%	0	9,753,943	14,391,127	24,145,070
12	74,771,942	258,754,462	333,526,404	0.00%	12.03%	5.93%	0	8,994,663	15,353,892	24,348,554
13	69,408,783	275,791,046	345,199,828	0.00%	12.00%	5.91%	0	8,329,607	16,285,746	24,615,353
14	64,559,019	292,722,803	357,281,822	0.00%	11.97%	5.88%	0	7,729,180	17,202,079	24,931,259
15	59,890,110	309,896,576	369,786,686	0.00%	11.94%	5.85%	0	7,153,203	18,123,331	25,276,535
16	55,185,456	327,543,764	382,729,220	0.00%	11.92%	5.82%	0	6,575,694	19,062,833	25,638,527
17	50,770,612	345,354,131	396,124,743	0.00%	11.89%	5.79%	0	6,035,361	20,002,276	26,037,638
18	46,699,382	363,289,727	409,989,109	0.00%	5.68%	-0.41%	0	2,654,849	(1,492,093)	1,162,756
19	42,596,551	381,742,177	424,338,728	0.00%	5.95%	-0.15%	0	2,532,651	(572,695)	1,959,956
20	38,412,957	400,777,626	439,190,583	0.00%	6.06%	-0.04%	0	2,327,553	(145,892)	2,181,661
21	34,377,528	420,184,726	454,562,254	0.00%	6.20%	0.10%	0	2,131,641	441,141	2,572,782
22	30,317,562	440,154,371	470,471,932	0.00%	5.85%	-0.24%	0	1,774,176	(1,072,743)	701,433
23	26,924,770	460,013,680	486,938,450	0.00%	6.05%	-0.04%	0	1,629,146	(206,826)	1,422,319
24	23,693,628	480,287,668	503,981,296	0.00%	6.16%	0.06%	0	1,459,169	301,585	1,760,754
25	20,280,492	501,340,149	521,620,641	0.00%	6.10%	0.00%	0	1,236,237	0	1,236,237
26	17,369,281	522,508,083	539,877,364	0.00%	6.10%	0.00%	0	1,058,778	0	1,058,778
27	14,634,170	544,138,901	558,773,071	0.00%	6.10%	0.00%	0	892,054	0	892,054
28	11,840,535	566,489,594	578,330,129	0.00%	6.10%	0.00%	0	721,763	0	721,763
29	9,322,174	589,249,509	598,571,683	0.00%	6.10%	0.00%	0	568,251	0	568,251
30	6,944,170	612,577,522	619,521,692	0.00%	6.10%	0.00%	0	423,295	0	423,295
31	4,783,845	636,421,107	641,204,952	0.00%	6.10%	0.00%	0	291,609	0	291,609
32	3,262,121	660,385,004	663,647,125	0.00%	6.10%	0.00%	0	198,849	0	198,849
33	2,136,493	684,738,281	686,874,774	0.00%	6.10%	0.00%	0	130,234	0	130,234
34	1,480,521	709,434,871	710,915,391	0.00%	6.10%	0.00%	0	90,248	0	90,248
35	1,113,341	734,684,089	735,797,430	0.00%	6.10%	0.00%	0	67,866	0	67,866
36	825,467	760,724,873	761,550,340	0.00%	6.10%	0.00%	0	50,318	0	50,318
37	608,962	787,595,640	788,204,602	0.00%	6.10%	0.00%	0	37,120	0	37,120
38	438,213	815,353,550	815,791,763	0.00%	6.10%	0.00%	0	26,712	0	26,712
39	311,734	844,032,741	844,344,475	0.00%	6.10%	0.00%	0	19,002	0	19,002
40	217,410	873,679,121	873,896,531	0.00%	6.10%	0.00%	0	13,253	0	13,253
41	149,616	904,333,294	904,482,910	0.00%	6.10%	0.00%	0	9,120	0	9,120
42	98,093	936,041,718	936,139,812	0.00%	6.10%	0.00%	0	5,979	0	5,979
43	63,153	968,841,552	968,904,705	0.00%	6.10%	0.00%	0	3,850	0	3,850
44	38,678	1,002,777,691	1,002,816,370	0.00%	6.10%	0.00%	0	2,358	0	2,358
45	23,020	1,037,891,923	1,037,914,943	0.00%	6.10%	0.00%	0	1,403	0	1,403
46	12,092	1,074,229,874	1,074,241,966	0.00%	6.10%	0.00%	0	737	0	737
47	6,379	1,111,834,056	1,111,840,435	0.00%	6.10%	0.00%	0	389	0	389
48	2,607	1,150,752,242	1,150,754,850	0.00%	6.10%	0.00%	0	159	0	159
49	1,037	1,191,030,233	1,191,031,270	0.00%	6.10%	0.00%	0	63	0	63
50	189	1,232,717,175	1,232,717,364	0.00%	6.10%	0.00%	0	12	0	12

**EMPLOYEES RETIREMENT SYSTEM OF THE CITY OF ST. LOUIS  
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**APPENDIX D – DETERMINATION OF DISCOUNT RATE**

**Table 1 - Projection of Contributions**

Projections Commence September 30, 2018

\* Total covered-employee payroll increases 3.50% per year

Year	Payroll for Current Employees (a)	Payroll for Future Employees (b)	Total Employee Payroll* (c) = (a) + (b)	EE Rate (d)	ER Rate (e)	AL Rate (f)	Employee Contributions from Current Employees	Employer Contributions for Current Employees	Contributions Related to Payroll of Future Employees	Total Contributions
							(g) = (a) x (d)	(h) = (a) x (e)	(i) = (b) x (f)	(j) = (g) + (h) + (i)
51	0	1,275,862,472	1,275,862,472	0.00%	6.10%	0.00%	0	0	0	0
52	0	1,320,517,658	1,320,517,658	0.00%	6.10%	0.00%	0	0	0	0
53	0	1,366,735,776	1,366,735,776	0.00%	6.10%	0.00%	0	0	0	0
54	0	1,414,571,528	1,414,571,528	0.00%	6.10%	0.00%	0	0	0	0
55	0	1,464,081,532	1,464,081,532	0.00%	6.10%	0.00%	0	0	0	0
56	0	1,515,324,386	1,515,324,386	0.00%	6.10%	0.00%	0	0	0	0
57	0	1,568,360,739	1,568,360,739	0.00%	6.10%	0.00%	0	0	0	0
58	0	1,623,253,365	1,623,253,365	0.00%	6.10%	0.00%	0	0	0	0
59	0	1,680,067,233	1,680,067,233	0.00%	6.10%	0.00%	0	0	0	0
60	0	1,738,869,586	1,738,869,586	0.00%	6.10%	0.00%	0	0	0	0
61	0	1,799,730,021	1,799,730,021	0.00%	6.10%	0.00%	0	0	0	0
62	0	1,862,720,572	1,862,720,572	0.00%	6.10%	0.00%	0	0	0	0
63	0	1,927,915,792	1,927,915,792	0.00%	6.10%	0.00%	0	0	0	0
64	0	1,995,392,845	1,995,392,845	0.00%	6.10%	0.00%	0	0	0	0
65	0	2,065,231,594	2,065,231,594	0.00%	6.10%	0.00%	0	0	0	0
66	0	2,137,514,700	2,137,514,700	0.00%	6.10%	0.00%	0	0	0	0
67	0	2,212,327,715	2,212,327,715	0.00%	6.10%	0.00%	0	0	0	0
68	0	2,289,759,185	2,289,759,185	0.00%	6.10%	0.00%	0	0	0	0
69	0	2,369,900,756	2,369,900,756	0.00%	6.10%	0.00%	0	0	0	0
70	0	2,452,847,283	2,452,847,283	0.00%	6.10%	0.00%	0	0	0	0
71	0	2,538,696,938	2,538,696,938	0.00%	6.10%	0.00%	0	0	0	0
72	0	2,627,551,330	2,627,551,330	0.00%	6.10%	0.00%	0	0	0	0
73	0	2,719,515,627	2,719,515,627	0.00%	6.10%	0.00%	0	0	0	0
74	0	2,814,698,674	2,814,698,674	0.00%	6.10%	0.00%	0	0	0	0
75	0	2,913,213,128	2,913,213,128	0.00%	6.10%	0.00%	0	0	0	0
76	0	3,015,175,587	3,015,175,587	0.00%	6.10%	0.00%	0	0	0	0
77	0	3,120,706,733	3,120,706,733	0.00%	6.10%	0.00%	0	0	0	0
78	0	3,229,931,468	3,229,931,468	0.00%	6.10%	0.00%	0	0	0	0
79	0	3,342,979,070	3,342,979,070	0.00%	6.10%	0.00%	0	0	0	0
80	0	3,459,983,337	3,459,983,337	0.00%	6.10%	0.00%	0	0	0	0
81	0	3,581,082,754	3,581,082,754	0.00%	6.10%	0.00%	0	0	0	0
82	0	3,706,420,650	3,706,420,650	0.00%	6.10%	0.00%	0	0	0	0
83	0	3,836,145,373	3,836,145,373	0.00%	6.10%	0.00%	0	0	0	0
84	0	3,970,410,461	3,970,410,461	0.00%	6.10%	0.00%	0	0	0	0
85	0	4,109,374,827	4,109,374,827	0.00%	6.10%	0.00%	0	0	0	0
86	0	4,253,202,946	4,253,202,946	0.00%	6.10%	0.00%	0	0	0	0
87	0	4,402,065,049	4,402,065,049	0.00%	6.10%	0.00%	0	0	0	0
88	0	4,556,137,326	4,556,137,326	0.00%	6.10%	0.00%	0	0	0	0
89	0	4,715,602,132	4,715,602,132	0.00%	6.10%	0.00%	0	0	0	0
90	0	4,880,648,207	4,880,648,207	0.00%	6.10%	0.00%	0	0	0	0
91	0	5,051,470,894	5,051,470,894	0.00%	6.10%	0.00%	0	0	0	0
92	0	5,228,272,375	5,228,272,375	0.00%	6.10%	0.00%	0	0	0	0
93	0	5,411,261,909	5,411,261,909	0.00%	6.10%	0.00%	0	0	0	0
94	0	5,600,656,075	5,600,656,075	0.00%	6.10%	0.00%	0	0	0	0
95	0	5,796,679,038	5,796,679,038	0.00%	6.10%	0.00%	0	0	0	0
96	0	5,999,562,804	5,999,562,804	0.00%	6.10%	0.00%	0	0	0	0
97	0	6,209,547,502	6,209,547,502	0.00%	6.10%	0.00%	0	0	0	0
98	0	6,426,881,665	6,426,881,665	0.00%	6.10%	0.00%	0	0	0	0
99	0	6,651,822,523	6,651,822,523	0.00%	6.10%	0.00%	0	0	0	0



**EMPLOYEES RETIREMENT SYSTEM OF THE CITY OF ST. LOUIS  
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**APPENDIX D – DETERMINATION OF DISCOUNT RATE**

**Table 2 - Projection of the Pension Plan's Fiduciary Net Position**

Projections Commence September 30, 2018

\* From Table 1 - Projection of Contributions, column (j)

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions* (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Net Position (f) = (a) + (b) - (c) - (d) + (e)
1	\$ 827,355,133	\$ 27,958,438	\$ 73,490,942	\$ 685,342	\$ 62,765,046	\$ 843,902,332
2	843,902,332	27,587,389	73,341,388	683,948	64,047,304	861,511,689
3	861,511,689	26,146,057	75,772,521	706,619	65,271,776	876,450,382
4	876,450,382	25,114,996	76,321,786	711,742	66,376,322	890,908,172
5	890,908,172	24,778,569	78,167,667	728,955	67,419,859	904,209,978
6	904,209,978	24,377,714	83,602,421	779,637	68,232,145	912,437,778
7	912,437,778	24,116,570	86,346,327	805,226	68,757,937	918,160,732
8	918,160,732	23,984,100	91,932,050	857,316	68,983,512	918,338,978
9	918,338,978	23,946,755	94,413,143	880,453	68,900,154	915,892,291
10	915,892,291	23,996,245	93,766,662	874,424	68,736,177	913,983,627
11	913,983,627	24,145,070	93,519,194	872,117	68,602,555	912,339,941
12	912,339,941	24,348,554	92,008,665	858,030	68,540,478	912,362,278
13	912,362,278	24,615,353	91,866,555	856,705	68,557,919	912,812,289
14	912,812,289	24,931,259	90,642,237	845,287	68,652,397	914,908,421
15	914,908,421	25,276,535	89,769,558	837,149	68,862,816	918,441,063
16	918,441,063	25,638,527	88,710,484	827,273	69,193,121	923,734,954
17	923,734,954	26,037,638	87,017,915	811,489	69,686,692	931,629,881
18	931,629,881	1,162,756	85,572,102	798,006	69,406,434	915,828,964
19	915,828,964	1,959,956	84,093,970	784,221	68,261,562	901,172,290
20	901,172,290	2,181,661	82,780,127	771,969	67,177,572	886,979,428
21	886,979,428	2,572,782	81,130,463	756,585	66,149,214	873,814,375
22	873,814,375	701,433	79,454,443	740,955	65,115,463	859,435,873
23	859,435,873	1,422,319	77,854,570	726,036	64,083,321	846,360,908
24	846,360,908	1,760,754	75,929,536	708,084	63,150,779	834,634,822
25	834,634,822	1,236,237	74,100,862	691,030	62,286,704	823,365,871
26	823,365,871	1,058,778	72,617,293	677,195	61,458,237	812,588,397
27	812,588,397	892,054	69,955,640	652,374	60,714,019	803,586,457
28	803,586,457	721,763	68,217,152	636,162	60,072,500	795,527,406
29	795,527,406	568,251	66,082,042	616,250	59,520,487	788,917,852
30	788,917,852	423,295	63,720,967	594,232	59,090,591	784,116,539
31	784,116,539	291,609	62,203,306	580,079	58,769,668	780,394,431
32	780,394,431	198,849	60,235,305	561,727	58,551,807	778,348,055
33	778,348,055	130,234	58,160,025	542,373	58,469,721	778,245,612
34	778,245,612	90,248	56,714,123	528,890	58,516,048	779,608,895
35	779,608,895	67,866	54,685,252	509,969	58,699,892	783,181,431
36	783,181,431	50,318	52,269,163	487,438	59,071,199	789,546,347
37	789,546,347	37,120	49,899,086	465,336	59,658,701	798,877,746
38	798,877,746	26,712	46,670,243	435,225	60,510,864	812,309,854
39	812,309,854	19,002	43,854,286	408,965	61,667,039	829,732,645
40	829,732,645	13,253	41,064,375	382,947	63,133,556	851,432,131
41	851,432,131	9,120	38,527,271	359,287	64,923,953	877,478,646
42	877,478,646	5,979	36,310,397	338,614	67,041,087	907,876,701
43	907,876,701	3,850	34,155,489	318,518	69,495,286	942,901,830
44	942,901,830	2,358	32,068,743	299,058	72,307,789	982,844,175
45	982,844,175	1,403	30,037,454	280,115	75,501,713	1,028,029,723
46	1,028,029,723	737	28,057,726	261,653	79,102,627	1,078,813,707
47	1,078,813,707	389	26,126,442	243,643	83,138,359	1,135,582,370
48	1,135,582,370	159	24,242,987	226,079	87,639,054	1,198,752,516
49	1,198,752,516	63	22,409,698	208,982	92,637,132	1,268,771,031
50	1,268,771,031	12	20,631,179	192,397	98,167,269	1,346,114,735

**EMPLOYEES RETIREMENT SYSTEM OF THE CITY OF ST. LOUIS  
GASB 67 AND 68 REPORTING FOR SEPTEMBER 30, 2018 MEASUREMENT DATE**

**APPENDIX D – DETERMINATION OF DISCOUNT RATE**

**Table 2 - Projection of the Pension Plan's Fiduciary Net Position**

Projections Commence September 30, 2018

\* From Table 1 - Projection of Contributions, column (j)

Year	Projected Beginning Fiduciary Net Position (a)	Projected Total Contributions* (b)	Projected Benefit Payments (c)	Projected Administrative Expenses (d)	Projected Investment Earnings (e)	Projected Ending Fiduciary Net Position (f) = (a) + (b) - (c) - (d) + (e)
51	1,346,114,735	0	18,914,450	176,387	104,266,385	1,431,290,284
52	1,431,290,284	0	17,261,437	160,972	110,973,925	1,524,841,799
53	1,524,841,799	0	15,677,428	146,200	118,332,125	1,627,350,296
54	1,627,350,296	0	14,165,153	132,098	126,386,199	1,739,439,244
55	1,739,439,244	0	12,726,592	118,682	135,184,701	1,861,778,670
56	1,861,778,670	0	11,363,036	105,966	144,779,843	1,995,089,511
57	1,995,089,511	0	10,078,564	93,988	155,227,701	2,140,144,660
58	2,140,144,660	0	8,876,593	82,779	166,588,428	2,297,773,716
59	2,297,773,716	0	7,758,223	72,350	178,926,691	2,468,869,835
60	2,468,869,835	0	6,724,398	62,709	192,312,120	2,654,394,848
61	2,654,394,848	0	5,776,674	53,871	206,819,676	2,855,383,980
62	2,855,383,980	0	4,916,354	45,848	222,530,058	3,072,951,836
63	3,072,951,836	0	4,142,194	38,628	239,530,252	3,308,301,267
64	3,308,301,267	0	3,452,727	32,199	257,914,138	3,562,730,480
65	3,562,730,480	0	2,846,552	26,546	277,783,030	3,837,640,412
66	3,837,640,412	0	2,320,030	21,636	299,246,342	4,134,545,088
67	4,134,545,088	0	1,868,402	17,424	322,422,351	4,455,081,613
68	4,455,081,613	0	1,486,388	13,861	347,438,955	4,801,020,318
69	4,801,020,318	0	1,167,589	10,888	374,434,487	5,174,276,327
70	5,174,276,327	0	905,412	8,443	403,558,582	5,576,921,054
71	5,576,921,054	0	692,958	6,462	434,973,077	6,011,194,710
72	6,011,194,710	0	523,288	4,880	468,852,976	6,479,519,518
73	6,479,519,518	0	389,659	3,634	505,387,472	6,984,513,698
74	6,984,513,698	0	286,231	2,669	544,781,013	7,529,005,810
75	7,529,005,810	0	207,282	1,933	587,254,447	8,116,051,042
76	8,116,051,042	0	147,908	1,379	633,046,268	8,748,948,023
77	8,748,948,023	0	103,931	969	682,413,932	9,431,257,054
78	9,431,257,054	0	71,962	671	735,635,271	10,166,819,691
79	10,166,819,691	0	49,087	458	793,010,040	10,959,780,186
80	10,959,780,186	0	33,004	308	854,861,580	11,814,608,454
81	11,814,608,454	0	21,861	204	921,538,615	12,736,125,004
82	12,736,125,004	0	14,303	133	993,417,198	13,729,527,765
83	13,729,527,765	0	9,251	86	1,070,902,808	14,800,421,236
84	14,800,421,236	0	5,909	55	1,154,432,628	15,954,847,901
85	15,954,847,901	0	3,720	35	1,244,477,993	17,199,322,138
86	17,199,322,138	0	2,313	22	1,341,547,037	18,540,866,841
87	18,540,866,841	0	1,421	13	1,446,187,559	19,987,052,965
88	19,987,052,965	0	861	8	1,558,990,098	21,546,042,194
89	21,546,042,194	0	514	5	1,680,591,271	23,226,632,947
90	23,226,632,947	0	302	3	1,811,677,358	25,038,310,000
91	25,038,310,000	0	173	2	1,952,988,173	26,991,297,998
92	26,991,297,998	0	96	1	2,105,321,240	29,096,619,141
93	29,096,619,141	0	51	0	2,269,536,291	31,366,155,381
94	31,366,155,381	0	26	0	2,446,560,119	33,812,715,474
95	33,812,715,474	0	12	0	2,637,391,806	36,450,107,268
96	36,450,107,268	0	5	0	2,843,108,367	39,293,215,629
97	39,293,215,629	0	1	0	3,064,870,819	42,358,086,447
98	42,358,086,447	0	1	0	3,303,930,743	45,662,017,189
99	45,662,017,189	0	1	0	3,561,637,341	49,223,654,529

**EMPLOYEES RETIREMENT SYSTEM OF THE CITY OF ST. LOUIS  
GASB 67 AND 68 REPORTING FOR SEPTEMBER 30, 2018 MEASUREMENT DATE**

**APPENDIX D – DETERMINATION OF DISCOUNT RATE**

**Table 3 - Actuarial Present Values of Projected Benefit Payments**

Projections Commence September 30, 2018

\* From Table 2 - Projection of the Pension Plan's Fiduciary Net Position, column (a)

\*\* From Table 2 - Projection of the Pension Plan's Fiduciary Net Position, column (c)

Year	Projected Beginning Fiduciary Net Position*	Projected Benefit Payments for current Plan participants**	"Funded" Portion of Benefit Payments (d) = (c) if (b) >= (c)	"Unfunded" Portion of Benefit Payments (e) = (c) - (d)	Present Value of "Funded" Benefit Payments (f) = (d) / (1+7.50%)^(a)	Present Value of "Unfunded" Benefit Payments (g) = (e) / (1+4.18%)^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) / (1+7.50%)^(a)
(a)	(b)	(c)	(c)	(e)	(f)	(g)	(h)
1	\$ 827,355,133	\$ 73,490,942	\$ 73,490,942	\$ 0	\$ 70,880,959	\$ 0	\$ 70,880,959
2	843,902,332	73,341,388	73,341,388	0	65,801,596	0	65,801,596
3	861,511,689	75,772,521	75,772,521	0	63,239,813	0	63,239,813
4	876,450,382	76,321,786	76,321,786	0	59,254,168	0	59,254,168
5	890,908,172	78,167,667	78,167,667	0	56,453,264	0	56,453,264
6	904,209,978	83,602,421	83,602,421	0	56,165,845	0	56,165,845
7	912,437,778	86,346,327	86,346,327	0	53,962,101	0	53,962,101
8	918,160,732	91,932,050	91,932,050	0	53,444,555	0	53,444,555
9	918,338,978	94,413,143	94,413,143	0	51,057,613	0	51,057,613
10	915,892,291	93,766,662	93,766,662	0	47,170,235	0	47,170,235
11	913,983,627	93,519,194	93,519,194	0	43,763,483	0	43,763,483
12	912,339,941	92,008,665	92,008,665	0	40,052,662	0	40,052,662
13	912,362,278	91,866,555	91,866,555	0	37,200,744	0	37,200,744
14	912,812,289	90,642,237	90,642,237	0	34,144,153	0	34,144,153
15	914,908,421	89,769,558	89,769,558	0	31,456,207	0	31,456,207
16	918,441,063	88,710,484	88,710,484	0	28,916,369	0	28,916,369
17	923,734,954	87,017,915	87,017,915	0	26,385,724	0	26,385,724
18	931,629,881	85,572,102	85,572,102	0	24,137,044	0	24,137,044
19	915,828,964	84,093,970	84,093,970	0	22,065,220	0	22,065,220
20	901,172,290	82,780,127	82,780,127	0	20,205,101	0	20,205,101
21	886,979,428	81,130,463	81,130,463	0	18,420,883	0	18,420,883
22	873,814,375	79,454,443	79,454,443	0	16,781,710	0	16,781,710
23	859,435,873	77,854,570	77,854,570	0	15,296,556	0	15,296,556
24	846,360,908	75,929,536	75,929,536	0	13,877,519	0	13,877,519
25	834,634,822	74,100,862	74,100,862	0	12,598,414	0	12,598,414
26	823,365,871	72,617,293	72,617,293	0	11,484,821	0	11,484,821
27	812,588,397	69,955,640	69,955,640	0	10,291,968	0	10,291,968
28	803,586,457	68,217,152	68,217,152	0	9,335,999	0	9,335,999
29	795,527,406	66,082,042	66,082,042	0	8,412,832	0	8,412,832
30	788,917,852	63,720,967	63,720,967	0	7,546,276	0	7,546,276
31	784,116,539	62,203,306	62,203,306	0	6,852,599	0	6,852,599
32	780,394,431	60,235,305	60,235,305	0	6,172,832	0	6,172,832
33	778,348,055	58,160,025	58,160,025	0	5,544,335	0	5,544,335
34	778,245,612	56,714,123	56,714,123	0	5,029,301	0	5,029,301
35	779,608,895	54,685,252	54,685,252	0	4,511,056	0	4,511,056
36	783,181,431	52,269,163	52,269,163	0	4,010,930	0	4,010,930
37	789,546,347	49,899,086	49,899,086	0	3,561,916	0	3,561,916
38	798,877,746	46,670,243	46,670,243	0	3,099,008	0	3,099,008
39	812,309,854	43,854,286	43,854,286	0	2,708,858	0	2,708,858
40	829,732,645	41,064,375	41,064,375	0	2,359,559	0	2,359,559
41	851,432,131	38,527,271	38,527,271	0	2,059,328	0	2,059,328
42	877,478,646	36,310,397	36,310,397	0	1,805,426	0	1,805,426
43	907,876,701	34,155,489	34,155,489	0	1,579,795	0	1,579,795
44	942,901,830	32,068,743	32,068,743	0	1,379,792	0	1,379,792
45	982,844,175	30,037,454	30,037,454	0	1,202,227	0	1,202,227
46	1,028,029,723	28,057,726	28,057,726	0	1,044,642	0	1,044,642
47	1,078,813,707	26,126,442	26,126,442	0	904,871	0	904,871
48	1,135,582,370	24,242,987	24,242,987	0	781,059	0	781,059
49	1,198,752,516	22,409,698	22,409,698	0	671,623	0	671,623
50	1,268,771,031	20,631,179	20,631,179	0	575,182	0	575,182

**EMPLOYEES RETIREMENT SYSTEM OF THE CITY OF ST. LOUIS  
GASB 67 AND 68 REPORTING FOR SEPTEMBER 30, 2018 MEASUREMENT DATE**

**APPENDIX D – DETERMINATION OF DISCOUNT RATE**

**Table 3 - Actuarial Present Values of Projected Benefit Payments**

Projections Commence September 30, 2018

\* From Table 2 - Projection of the Pension Plan's Fiduciary Net Position, column (a)

\*\* From Table 2 - Projection of the Pension Plan's Fiduciary Net Position, column (c)

Year	Projected Fiduciary Net Position*	Projected Benefit Payments for current Plan participants**	"Funded" Portion of Benefit Payments (d) = (c) if (b) >= (c)	"Unfunded" Portion of Benefit Payments (e) = (c) - (d)	Present Value of "Funded" Benefit Payments (f) = (d) / (1+7.50%)^(a)	Present Value of "Unfunded" Benefit Payments (g) = (e) / (1+4.18%)^(a)	Present Value of Benefit Payments Using the Single Discount Rate (h) = (c) / (1+7.50%)^(a)
(a)	(b)	(c)	(c)	(e)	(f)	(g)	(h)
51	\$ 1,346,114,735	\$ 18,914,450	\$ 18,914,450	\$ 0	\$ 490,531	\$ 0	\$ 490,531
52	1,431,290,284	17,261,437	17,261,437	0	416,429	0	416,429
53	1,524,841,799	15,677,428	15,677,428	0	351,828	0	351,828
54	1,627,350,296	14,165,153	14,165,153	0	295,712	0	295,712
55	1,739,439,244	12,726,592	12,726,592	0	247,144	0	247,144
56	1,861,778,670	11,363,036	11,363,036	0	205,270	0	205,270
57	1,995,089,511	10,078,564	10,078,564	0	169,364	0	169,364
58	2,140,144,660	8,876,593	8,876,593	0	138,759	0	138,759
59	2,297,773,716	7,758,223	7,758,223	0	112,815	0	112,815
60	2,468,869,835	6,724,398	6,724,398	0	90,960	0	90,960
61	2,654,394,848	5,776,674	5,776,674	0	72,689	0	72,689
62	2,855,383,980	4,916,354	4,916,354	0	57,547	0	57,547
63	3,072,951,836	4,142,194	4,142,194	0	45,103	0	45,103
64	3,308,301,267	3,452,727	3,452,727	0	34,972	0	34,972
65	3,562,730,480	2,846,552	2,846,552	0	26,821	0	26,821
66	3,837,640,412	2,320,030	2,320,030	0	20,335	0	20,335
67	4,134,545,088	1,868,402	1,868,402	0	15,234	0	15,234
68	4,455,081,613	1,486,388	1,486,388	0	11,274	0	11,274
69	4,801,020,318	1,167,589	1,167,589	0	8,238	0	8,238
70	5,174,276,327	905,412	905,412	0	5,942	0	5,942
71	5,576,921,054	692,958	692,958	0	4,231	0	4,231
72	6,011,194,710	523,288	523,288	0	2,972	0	2,972
73	6,479,519,518	389,659	389,659	0	2,059	0	2,059
74	6,984,513,698	286,231	286,231	0	1,407	0	1,407
75	7,529,005,810	207,282	207,282	0	948	0	948
76	8,116,051,042	147,908	147,908	0	629	0	629
77	8,748,948,023	103,931	103,931	0	411	0	411
78	9,431,257,054	71,962	71,962	0	265	0	265
79	10,166,819,691	49,087	49,087	0	168	0	168
80	10,959,780,186	33,004	33,004	0	105	0	105
81	11,814,608,454	21,861	21,861	0	65	0	65
82	12,736,125,004	14,303	14,303	0	39	0	39
83	13,729,527,765	9,251	9,251	0	24	0	24
84	14,800,421,236	5,909	5,909	0	14	0	14
85	15,954,847,901	3,720	3,720	0	8	0	8
86	17,199,322,138	2,313	2,313	0	5	0	5
87	18,540,866,841	1,421	1,421	0	3	0	3
88	19,987,052,965	861	861	0	2	0	2
89	21,546,042,194	514	514	0	1	0	1
90	23,226,632,947	302	302	0	0	0	0
91	25,038,310,000	173	173	0	0	0	0
92	26,991,297,998	96	96	0	0	0	0
93	29,096,619,141	51	51	0	0	0	0
94	31,366,155,381	26	26	0	0	0	0
95	33,812,715,474	12	12	0	0	0	0
96	36,450,107,268	5	5	0	0	0	0
97	39,293,215,629	1	1	0	0	0	0
98	42,358,086,447	1	1	0	0	0	0
99	45,662,017,189	1	1	0	0	0	0
					<b>\$ 1,068,488,494</b>	<b>+</b>	<b>\$ 0 = \$ 1,068,488,494</b>

## APPENDIX E - GLOSSARY OF TERMS

### 1. Actuarially Determined Contribution

A target or recommended contribution for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contribution for the reporting period was adopted.

### 2. Actuarial Valuation Date

The date as of which an actuarial valuation is performed. This date may be up to 24 months prior to the measurement date and up to 30 months prior to the employer's reporting date.

### 3. Deferred Inflow of Resources

An acquisition of net assets by a government employer that is applicable to a future reporting period. In the context of GASB 68, these are experience gains on the Total Pension Liability, assumption changes reducing the Total Pension Liability, or investment gains that are recognized in future reporting periods.

### 4. Deferred Outflow of Resources

A consumption of net assets by a government employer that is applicable to a future reporting period. In the context of GASB 68, these are experience losses on the Total Pension Liability, assumption changes increasing the Total Pension Liability, or investment losses that are recognized in future reporting periods.

### 5. Entry Age Actuarial Cost Method

The actuarial cost method required for GASB 67 and 68 calculations. Under this method, the actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis over the earnings of the individual between entry age and assumed exit ages. The portion of this actuarial present value allocated to a valuation year is called the Service Cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future service costs is called the Total Pension Liability.

### 6. Measurement Date

The date as of which the Total Pension Liability and Plan Fiduciary Net Position are measured. The Total Pension Liability may be projected from the Actuarial Valuation Date to the Measurement Date. The Measurement Date must be the same as the Reporting Date for the plan.

APPENDIX E - GLOSSARY OF TERMS

**7. Net Pension Liability**

The liability of employers and non-employer contributing entities for employees with benefits provided through a defined benefit pension plan. It is calculated as the Total Pension Liability less the Plan Fiduciary Net Position.

**8. Plan Fiduciary Net Position**

The fair or market value of assets.

**9. Reporting Date**

The last day of the plan or employer's fiscal year.

**10. Service Cost**

The portion of the actuarial present value of projected benefit payments that is attributed to the current period of employee service in conformity with the requirements of GASB 67 and 68. The Service Cost is the normal cost calculated under the Entry Age Actuarial Cost Method.

**11. Total Pension Liability**

The portion of the actuarial present value of projected benefit payments that is attributed to past periods of employee service in conformity with the requirements of GASB 67 and 68. The Total Pension Liability is the actuarial liability calculated under the Entry Age Actuarial Cost Method. This measurement generally is not appropriate for estimating the cost to settle the Plan's liabilities.



*Classic Values, Innovative Advice*