Firemen's Retirement System of St. Louis

GASB Statement Nos. 67 and 68 Plan Reporting and Accounting Schedules as of October 1, 2018

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January 24, 2019

Mr. John D. Brewer
Executive Director
The Firemen's Retirement System of St. Louis
1601 South Broadway
St. Louis, Missouri 63104

Dear Mr. Brewer:

This report provides information required by the Firemen's Retirement System of St. Louis (FRS) in connection with the Governmental Accounting Standards Board (GASB) Statements No. 67 and 68 "Financial Reporting for Pension Plans."

Our actuarial calculations for this report were prepared for the purpose of complying with the requirements of GASB Statements No. 67 and 68. These calculations have been made on a basis that is consistent with our understanding of these accounting standards.

Our calculation of the liability associated with the benefits described in this report was performed for the purpose of satisfying the requirements of GASB Statements No. 67 and 68. The calculation of the plan's liability for this report may not be applicable for funding purposes of the plan. A calculation of the plan's liability for purposes other than satisfying the requirements of GASB Statements No. 67 and 68 may produce significantly different results. This report may be provided to parties other than the Firemen's Retirement System of St. Louis ("FRS") only in its entirety and only with the permission of FRS. GRS is not responsible for unauthorized use of this report.

This report is based upon information, furnished to us by FRS, concerning retirement and ancillary benefits, active members, deferred vested members, retirees and beneficiaries, and financial data.

This report is also based on discussions with the City's auditor concerning the application of the entry age normal method for closed plans with frozen accrued benefits. If your understanding of this information is different, please let us know. This information was checked for internal consistency, but it was not audited.

This report complements the actuarial valuation report that was provided to FRS and should be considered in conjunction with that report. Please see the actuarial valuation report as of October 1, 2018, for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

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To the best of our knowledge, the information contained within this report is accurate and fairly represents the actuarial position of the Firemen's Retirement System of St. Louis as it applies to GASB Statements No. 67 and 68. All calculations have been made in conformity with generally accepted actuarial principles and practices as well as with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

The signing actuaries are independent of the plan sponsor.

Alex Rivera and Lance J. Weiss are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,

Alex Rivera   Lance J. Weiss

Alex Rivera, FSA, EA, MAAA, FCA
Senior Consultant

Lance J. Weiss, EA, MAAA, FCA
Senior Consultant

Auditor’s Note – This information is presented in draft form for review by the Plan’s auditor. Please let us know if there are any items that the auditor changes so that we may maintain consistency with the Plan’s financial statements.

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SECTION A

EXECUTIVE SUMMARY

Executive Summary
as of October 1, 2018

		2018
Actuarial Valuation Date		October 1, 2018
Pension Plan's Fiscal Year Ending Date (Measurement Date & Reporting Date)		October 1, 2018
Membership		
Number of		
- Retirees and Beneficiaries		894
- Active DROP Members		65
- Active Non-DROP Members		455
- Total		1,414
Covered Payroll [1]	$	29,796,947
Net Pension Liability		
Total Pension Liability	$	459,237,398
Plan Fiduciary Net Position [2]		477,152,696
Net Pension Liability	$	(17,915,298)
Plan Fiduciary Net Position as a Percentage of Total Pension Liability		103.90%
Net Pension Liability as a Percentage of Covered Payroll		-60.12%
Development of the Single Discount Rate		
Single Discount Rate Beginning of Year		7.300%
Single Discount Rate End of Year		7.300%
Long-Term Expected Rate of Return		7.300%
Long-Term Municipal Bond Rate Beginning of Year [3]		3.50%
Long-Term Municipal Bond Rate End of Year [3]		3.83%
Year Plan is projected to be fully funded		2019
GASB No. 68 Pension Expense	$	1,022,978

Deferred Outflows and Deferred Inflows of Resources to be Recognized in Future Pension Expenses

		Deferred Outflows of Resources		Deferred (Inflows) of Resources
Difference between expected and actual non-investment experience	$	-	$	(16,871,743)
Changes in assumptions		-		-
Difference between expected and actual investment earnings		17,456,701		(19,730,389)
Total	$	17,456,701	$	(36,602,132)

[1] *Excludes payroll for current DROP members.*

[2] *Excludes Future Benefit Fund restricted for SHARE program benefits.*

[3] Source: *The rates at the beginning and end of the year are based on the fixed-income municipal bonds with 20 years to maturity that included only federally tax-exempt municipal bonds as reported in Fidelity Index's "20-Year Municipal GO AA Index". In describing this index, Fidelity notes that the municipal curves are constructed using option-adjusted analytics of a diverse population of over 10,000 tax-exempt securities.*

Discussion

Accounting Standard

For pension plans that are administered through trusts or equivalent arrangements, Governmental Accounting Standards Board (GASB) Statement No. 67 establishes standards of financial reporting for separately issued financial reports and specifies the required approach for measuring the pension liability. Similarly, GASB Statement No. 68 establishes standards for state and local government employers (as well as non-employer contributing entities) to account for and disclose the net pension liability, pension expense and other information associated with providing retirement benefits to their employees (and former employees) on their basic financial statements.

The following discussion provides a summary of the information that is required to be disclosed under these accounting standards. A number of these disclosure items are provided in this report. However, certain additional required information, such as notes regarding accounting policies and investments, is not included in this report and the retirement system and/or plan sponsor will be responsible for preparing and disclosing that information to comply with these accounting standards.

Financial Statements

GASB Statement No. 68 requires state or local governments to recognize the net pension liability and the pension expense on their financial statements. The net pension liability is the difference between the total pension liability and the plan's fiduciary net position. In traditional actuarial terms, this is analogous to the accrued liability less the market value of assets.

The pension expense recognized each fiscal year is equal to the change in the net pension liability from the beginning of the year to the end of the year, adjusted for deferred recognition of the liability and investment experience.

Pension plans that prepare their own, stand-alone financial statements, are required to present two financial statements – a statement of fiduciary net position and a statement of changes in fiduciary net position in accordance with GASB Statement No. 67. The *statement of fiduciary net position* presents the assets and liabilities of the pension plan at the end of the pension plan's reporting period. The *statement of changes in fiduciary net position* presents additions, such as contributions and investment income, and deductions, such as benefit payments and expenses and net increase or decrease in the fiduciary net position.

Notes to Financial Statements

GASB Statement No. 68 requires, in the notes of the employer's financial statements, a disclosure of the total pension expense, the pension plan's liabilities and assets and deferred outflows and inflows of resources related to pensions.

Both GASB Statements, No. 67 and 68, require the notes of the financial statements for the employers and pension plans, to include certain additional information. The list of additional disclosure items should include:

- A description of benefits provided by the plan;
- The type of employees and number of members covered by the pension plan;
- A description of the plan's funding policy, which includes member and employer contribution requirements;
- The pension plan's investment policies;
- The pension plan's fiduciary net position, net pension liability and the pension plan's fiduciary net position as a percentage of the total pension liability;
- The net pension liability using a discount rate that is 1% higher and 1% lower than used to calculate the total pension liability and net pension liability for financial reporting purposes;
- Significant assumptions and methods used to calculate the total pension liability;
- Inputs to the discount rates; and
- Certain information about mortality assumptions and the dates of experience studies.

Retirement systems that issue stand-alone financial statements are required to disclose additional information in accordance with Statement No. 67. This information includes:

- The composition of the pension plan's board and the authority under which benefit terms may be amended;
- A description of how fair value is determined;
- Information regarding certain reserves and investments, which include concentrations of investments greater than or equal to 5%, receivables, and insurance contracts excluded from plan assets; and
- Annual money-weighted rate of return.

Required Supplementary Information

GASB Statement No. 67 requires a 10-year fiscal history of:

- Sources of changes in the net pension liability;
- Information about the components of the net pension liability and related ratios, including the pension plan's fiduciary net position as a percentage of the total pension liability and the net pension liability as a percent of covered-employee payroll;
- Comparison of the actual employer contributions to the actuarially determined contributions based on the plan's funding policy; and
- The annual money-weighted rate of return on pension plan investments for each year.

These tables may be built prospectively as the information becomes available.

Measurement of the Net Pension Liability

The net pension liability is to be measured as the total pension liability, less the amount of the pension plan's fiduciary net position. In traditional actuarial terms, this will be the accrued liability less the market value of assets.

Timing of the Valuation

An actuarial valuation to determine the total pension liability is required to be performed at least once every two years. If the actuarial valuation is not calculated as of the plan's fiscal year end, the total pension liability is required to be rolled forward from the actuarial valuation date to the pension plan's fiscal year end.

The total pension liability shown in this report is based on an actuarial valuation performed as of October 1, 2018, and a measurement date of October 1, 2018.

Single Discount Rate

Projected benefit payments are required to be discounted to their actuarial present values using a single discount rate that reflects: (1) a long-term expected rate of return on pension plan investments (to the extent that the plan's fiduciary net position is projected to be available and sufficient to pay benefits) and (2) a tax-exempt municipal bond rate based on an index of 20-year mixed maturity, general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

The long-term expected rate of return for the FRS funding is assumed to be 7.000%. Per Statute, this rate is net of both investment and administrative expenses. GASB Statements No. 67 and 68 require the long-term expected rate of return to be determined net of pension plan investment expense but without reduction for pension plan administrative expense. Administrative expenses are assumed to be approximately 30 basis points; consequently, the long-term expected rate of return used for purposes of GASB Statements No. 67 and 68 is increased by 30 basis points to 7.300%. This rate is gross of administrative expenses.

For the purpose of this actuarial valuation, the expected rate of return on pension plan investments is 7.300%, the municipal bond rate is 3.830% (based on the most recent daily rate available on or before the measurement date of the Fidelity "20-Year Municipal GO AA Index"); and the resulting single discount rate is 7.300%.

The single discount rate is the same as the expected rate of return on pension plan assets because FRS is closed to new members, benefits are frozen as of February 1, 2013, and the plan is fully funded in 2018. Our projection assumes the City will make contributions as required by statute.

Effective Date and Transition

GASB Statement No. 67 is effective for a pension plan's fiscal years beginning after June 15, 2013, and GASB Statement No. 68 is effective for a pension plan's fiscal years beginning after June 15, 2014; however, earlier application is encouraged by the GASB.

SECTION B

FINANCIAL STATEMENTS

Auditor's Note – This information is subject to review by the System's auditor. Please let us know if the System's auditor recommends any changes.

Statement of Fiduciary Net Position
as of October 1, 2018

		2018
Assets		
Investments		
Fixed income	$	107,122,033
Equities		214,322,155
Hedge funds		83,393,666
Real estate		46,454,643
Limited partnership units		19,114,182
Money market funds		7,637,199
Total Investments	$	478,043,878
Cash and Deposits	$	3,800,722
Receivables		
Interest and dividends	$	292,707
Unsettled investment transactions		3,325,659
Other receivables		385,958
Employer contributions		-
Total Receivables	$	4,004,324
Capital Assets, less Accumulated Depreciation	$	392,762
Total Assets	$	486,241,686
Deferred Outflows of Resources		
Systems' staff pension related	$	56,933
Liabilities		
Payables		
Unsettled investment transactions	$	3,726,157
Accrued investment management fees		319,354
Net pension liability - Systems' staff pension related		222,861
Members contributions refundable		24,528
Accrued administrative expenses		21,789
Due to The Firefighters' Retirement Plan of the City of St. Louis		-
Total Liabilities	$	4,314,689
Deferred Inflows of Resources		
Systems' staff pension related	$	5,280
Net Position	$	481,978,650
Future Benefit Fund Restricted for SHARE Program	$	4,825,954
Net Position Restricted for Pensions	$	477,152,696

Statement of Changes in Fiduciary Net Position for Year Ended October 1, 2018

		2018
Additions		
Contributions		
Employer	$	2,715,141
Employee		-
Other		-
Total Contributions	$	2,715,141
Investment Income		
Net Appreciation in Fair Value of Investments	$	20,021,165
Dividends		4,474,310
Interest		2,047,212
Class Action Lawsuit Proceeds		62,168
Securities Lending Income		189,245
Less Investment Expense		(2,024,352)
Net Investment Income	$	24,769,748
Other	$	-
Total Additions	$	27,484,889
Deductions		
Benefit Payments		32,161,027
Benefit Payments SHARE Program		493,945
Refunds of Employee Contributions		649,093
Pension Plan Administrative Expense		1,050,387
Other		-
Total Deductions	$	34,354,452
Net Increase in Net Position	$	(6,869,563)
Transfer Out Due to Settlement Agreement	$	-
Net Position		
Beginning of Year	$	488,848,213
End of Year	$	481,978,650
Future Benefit Fund Restricted for SHARE Program	$	4,825,954
Net Position Restricted for Pensions	$	477,152,696

SECTION C

REQUIRED SUPPLEMENTARY INFORMATION

Auditor's Note – This information is subject to review by the System's auditor. Please let us know if the System's auditor recommends any changes.

Schedules of Required Supplementary Information
Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

Fiscal year ending October 1,	2018	2017	2016	2015	2014 - Restated	2014
Total Pension Liability						
Service Cost	$ -	$ -	$ -	$ -	$ -	$ 3,917,882
Interest on the Total Pension Liability	32,729,886	34,536,458	34,916,115	34,403,495	34,449,637	35,325,590
Benefit Changes	-	-	-	-	-	-
Difference between Expected and Actual Experience	(5,442,030)	(26,462,974)	(6,984,303)	15,441	-	-
Assumption Changes	-	-	-	43,915,338	-	-
Benefit Payments	(32,161,027)	(32,015,540)	(32,154,888)	(33,561,947)	(34,001,921)	(34,001,921)
Refunds	(649,093)	(816,435)	(1,278,330)	(1,294,477)	(1,205,393)	(1,205,393)
Net Change in Total Pension Liability	(5,522,264)	(24,758,491)	(5,501,406)	43,477,850	(757,677)	4,036,158
Total Pension Liability - Beginning	464,759,662	489,518,153	495,019,559	451,541,709	452,299,386	461,095,233
Total Pension Liability - Ending (a)	$ 459,237,398	$ 464,759,662	$ 489,518,153	$ 495,019,559	$ 451,541,709	$ 465,131,391
Plan Fiduciary Net Position						
Employer Contributions	$ 2,715,141	$ 3,313,603	$ 2,715,140	$ -	$ 1,007,760	$ 1,007,760
Employee Contributions	-	-	-	-	-	-
Pension Plan Net Investment Income	24,519,983	60,390,472	38,228,538	(10,931,763)	48,269,780	48,269,780
Benefit Payments	(32,161,027)	(32,015,540)	(32,154,888)	(33,561,947)	(34,001,921)	(34,001,921)
Refunds	(649,093)	(816,435)	(1,278,330)	(1,294,477)	(1,205,393)	(1,205,393)
Pension Plan Administrative Expense	(1,050,387)	(1,067,626)	(1,095,335)	(1,593,979)	(1,424,217)	(1,424,217)
Transfer (Out)/In Due to Settlement Agreement	166,792	166,792	166,792	-	(10,278,591)	(10,278,591)
Net Change in Plan Fiduciary Net Position	(6,458,591)	29,971,266	6,581,917	(47,382,166)	2,367,418	2,367,418
Plan Fiduciary Net Position - Beginning [a]	483,611,287	453,640,021	447,058,104	494,440,270	492,221,578	492,221,578
Plan Fiduciary Net Position - Ending (b)	$ 477,152,696	$ 483,611,287	$ 453,640,021	$ 447,058,104	$ 494,588,996	$ 494,588,996
Net Pension Liability - Ending (a) - (b)	(17,915,298)	(18,851,625)	35,878,132	47,961,455	(43,047,287)	(29,457,605)
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	103.90 %	104.06 %	92.67 %	90.31 %	109.53 %	106.33 %
Covered Employee Payroll	$ 29,796,947	$ 31,079,373	$ 30,219,253	$ 30,288,086	$ 29,767,542	$ 29,767,542
Net Pension Liability as a Percentage of Covered Employee Payroll	(60.12)%	(60.66)%	118.73 %	158.35 %	(144.61)%	(98.96)%

Notes to Schedule:

[a] *Reflects a net pension liability adjustment for the Systems' staff pension plan of $148,726 excluded from the market value of assets as of September 30, 2014, and provided for the actuarial valuation as of October 1, 2014.*

10 fiscal years will be built prospectively.

Schedules of Required Supplementary Information
Schedule of the Net Pension Liability Multiyear

FY Ending October 1,	Total Pension Liability	Plan Net Position	Net Pension Liability	Plan Net Position as a % of Total Pension Liability	Covered Payroll	Net Pension Liability as a % of Covered Payroll
2014	$ 465,131,391	$ 494,588,996	$ (29,457,605)	106.33%	$ 29,767,542	-98.96%
2014 - Restated	451,541,709	494,588,996	(43,047,287)	109.53%	29,767,542	-144.61%
2015	495,019,559	447,058,104	47,961,455	90.31%	30,288,086	158.35%
2016	489,518,153	453,640,021	35,878,132	92.67%	30,219,253	118.73%
2017	464,759,662	483,611,287	(18,851,625)	104.06%	31,079,373	-60.66%
2018	459,237,398	477,152,696	(17,915,298)	103.90%	29,796,947	-60.12%

10 fiscal years will be built prospectively.

Schedule of Contributions Multiyear
Last 10 Fiscal Years

FY Ending October 1,	Actuarially Determined Contribution	Actual Contribution	Contribution Deficiency (Excess)	Covered Payroll	Actual Contribution as a % of Covered Payroll
2014	$ 1,007,760	$ 1,007,760	$ -	$ 29,767,542	3.39%
2015	-	-	-	30,288,086	0.00%
2016	2,715,140	2,715,140	-	30,219,253	8.98%
2017	3,313,603	3,313,603	-	31,079,373	10.66%
2018	2,715,141	2,715,141	-	29,796,947	9.11%

10 fiscal years will be built prospectively.

Notes to Schedule of Contributions

Valuation Date:	October 1, 2018
Notes	Actuarially determined contribution rates are calculated as of October 1, which corresponds to the beginning of the plan year in which contributions will be made.

Methods and Assumptions Used to Determine Contributions:

Actuarial Cost Method	Entry Age - Frozen Initial Liability (FIL)
Amortization Method	30-year closed period from establishment
Remaining Amortization Period	Various
Asset Valuation Method	3-year smoothed market
Inflation	2.75%
Salary Increases [a]	3.00% to 4.00% based on service. FRS benefits were frozen as of February 1, 2013, therefore no salary increases have been assumed in FRS for purposes of determining benefits.
Investment Rate of Return	7.000%, net of investment and administrative expenses
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition. Updated for the 2015 valuation pursuant to an experience study of the period October 1, 2010, through September 30, 2014.
Mortality	The post-retirement ordinary mortality rates are based on the RP-2014 Healthy Annuitant mortality table, sex distinct. The pre-retirement mortality rates are based on the RP-2014 Employee mortality tables, sex distinct. The post-disability mortality rates are assumed to be 20 percent higher than post-retirement mortality rates.

Other Information:

Notes	There were no benefit changes during the year.

Methods and Assumptions Used for Accounting Purposes as of the Valuation Date:

Actuarial Cost Method	Entry Age Normal, assumes all benefits are fully accrued as of the freeze date of July 1, 2013.
Discount Rate	7.300% as of the October 1, 2017, actuarial valuation. 7.300% as of the October 1, 2018, actuarial valuation.

[a] *The present value of future salaries is used to develop the normal cost under the FIL cost method.*

Schedule of Investment Returns Multiyear
Last 10 Fiscal Years

FY Ending October 1,	Annual Return[1]
2013	14.41 %
2014	10.32 %
2015	(2.42)%
2016	9.20 %
2017	14.69 %
2018	5.82 %

[1] *Annual money-weighted rate of return, net of investment expenses.*

Calculated by FRS. 10 fiscal years will be built prospectively.

SECTION D

NOTES TO FINANCIAL STATEMENTS

Auditor's Note – This information is subject to review by the System's auditor. Please let us know if the System's auditor recommends any changes.

Long-Term Expected Return on Plan Assets

The assumed rate of investment return was adopted by the plan's trustees after considering input from the plan's investment consultant(s) and actuary(s). Additional information about the assumed rate of investment return is included in our actuarial valuation report as of October 1, 2018. The assumed rate of investment return was most recently analyzed in the experience review for the period October 1, 2010, through September 30, 2014.

The long-term expected rate of return on pension plan investments was determined using a building-block method in which expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These real rates of return are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. For each major asset class that is included in the pension plan's target asset allocation as of October 1, 2014, these best estimates are summarized in the following table:

Asset Allocation

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Fixed Income	25.00%	-1.30%
Domestic Equity	26.00%	4.30%
International Equity	24.00%	4.70%
Private Equity	0.00%	9.40%
Real Estate	15.00%	4.80%
Nondirectional Hedge Fund of Funds	10.00%	2.20%
Money Market	0.00%	0.00%
Total	100.00%	

The above long-term expected real rate of returns represents best estimates of arithmetic rates of return for each major asset class included. These rate of returns are shown net of inflation (assumed at 2.75%, by actuary) and net of investment expenses (assumed at 0.50%, by investment consultant).

Asset allocation information provided by the Plan's investment consultant.

Single Discount Rate

A single discount rate of 7.300% was used to measure the total pension liability. This single discount rate was based on the expected rate of return on pension plan investments of 7.300%. The projection of cash flows used to determine this single discount rate assumed that the plan sponsor would make the required contributions as defined by Statute. Based on these assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Regarding the sensitivity of the net pension liability to changes in the single discount rate, the following presents the plan's net pension liability, calculated using a single discount rate of 7.300%, as well as what the plan's net pension liability would be if it were calculated using a single discount rate that is one percentage-point lower or one percentage-point higher:

Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

1% Decrease 6.300%	Current Single Discount Rate Assumption 7.300%	1% Increase 8.300%
$23,843,191	$(17,915,298)	$(53,527,509)

Disclosure Regarding the Deferred Retirement Option Program

A member eligible for service retirement may defer receipt of the service retirement benefit for up to five years while continuing active employment. The amount the member would have received as a service retirement benefit is deposited into the DROP account. A member terminating the DROP plan may retire or continue active service. Service while in the DROP will not count as creditable service. Upon termination of employment, the member may choose to receive the DROP account with the interest earned by the account.

Summary of DROP Accounts as of Actuarial Valuation Date

	Active Members				Non-Active Members		Total Members	
	In DROP		Previously in DROP		Previously in DROP		with DROP Balance	
	Count	DROP Balance	Count	DROP Balance	Count	DROP Balance	Count	DROP Balance
2017	59	$ 3,816,955	59	$ 11,619,376	96	$ 17,810,165	214	$ 33,246,496
2018	65	4,849,794	62	12,503,202	92	17,954,353	219	35,307,349

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	894
Active Plan Members Currently in the DROP	65
Active Plan Members	455
Total Plan Members	1,414

Additional information about the member data used can be found in the October 1, 2018, funding actuarial valuation report.

SECTION E

GASB STATEMENT NO. 68 PENSION EXPENSE

Net Pension Liability
for Fiscal Year ending October 1, 2018

A. Total pension liability		
1. Service Cost	$	-
2. Interest on the Total Pension Liability		32,729,886
3. Changes of benefit terms		-
4. Difference between expected and actual experience		(5,442,030)
5. Changes of assumptions		-
6. Benefit payments		(32,161,027)
7. Refunds of employee contributions		(649,093)
8. Net change in total pension liability	$	(5,522,264)
9. Total Pension liability - beginning (October 1, 2017)		464,759,662
10. Total Pension liability - ending (October 1, 2018)	**$**	**459,237,398**
B. Plan fiduciary net position		
1. Contributions – employer	$	2,715,141
2. Contributions – employee		-
3. Net investment income		24,519,983
4. Benefit payments, including refunds of employee contributions		(32,810,120)
5. Pension Plan Administrative Expense		(1,050,387)
6. Transfer (Out)/In Due to Settlement Agreement		166,792
7. Net change in plan fiduciary net position	$	(6,458,591)
8. Plan fiduciary net position - beginning (October 1, 2017)		483,611,287
9. Plan fiduciary net position - ending (October 1, 2018)	**$**	**477,152,696**
C. Net pension liability as of October 1, 2018	**$**	**(17,915,298)**
D. Plan fiduciary net position as a percentage of the total pension liability		**103.90%**
E. Covered-employee payroll	**$**	**29,796,947**
F. Net pension liability as a percentage of covered employee payroll		**(60.12)%**

Pension Expense
for Fiscal Year ending October 1, 2018

A. Expense		
1. Service Cost	$	-
2. Interest on the Total Pension Liability		32,729,886
3. Current-Period Benefit Changes		-
4. Employee Contributions (made negative for addition here)		-
5. Projected Earnings on Plan Investments (made negative for addition here)		(34,172,906)
6. Pension Plan Administrative Expense		1,050,387
7. Other Changes - Transfer Due to Settlement Agreement		(166,792)
8. Recognition of Outflow (Inflow) due to Liability Experience		(10,884,009)
9. Recognition of Outflow (Inflow) due to Assumption Changes		10,044,177
10. Recognition of Outflow (Inflow) due to Investment Experience		2,422,235
11. Total Pension Expense	**$**	**1,022,978**

B. Reconciliation of Net Pension Liability		
1. Net Pension Liability beginning of year	**$**	**(18,851,625)**
2. Pension Expense		1,022,978
3. Employer Contributions		(2,715,141)
4. Change in Deferred Liability Experience (Inflows)/Outflows		5,441,979
5. Change in Deferred Assumption Changes (Inflows)/Outflows		(10,044,177)
6. Change in Deferred Investment Experience (Inflows)/Outflows		7,230,688
7. Net Pension Liability end of year	**$**	**(17,915,298)**

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods for Fiscal Year ending October 1, 2018

A. Outflows and (Inflows) of Resources Recognized in Current and Future Pension Expenses as of Fiscal Year End October 1, 2018

Experience (Gain)/Loss	Original Balance	Date Established	Original Recognition Period/ Amortization Factor	Amount Recognized in Past Pension Expenses	Amount Recognized in Current Pension Expense	Deferred (Inflows) to be Recognized in Future Pension Expenses	Deferred Outflows to be Recognized in Future Pension Expenses
1. Differences Between Expected	$ (5,442,030)	October 1, 2018	3.3994	$ -	$ (1,600,878)	$ (3,841,152)	$ -
and Actual Non-Investment Experience	(26,462,974)	October 1, 2017	3.5571	(7,439,403)	(7,439,403)	(11,584,168)	-
	(6,984,303)	October 1, 2016	3.7836	(3,691,920)	(1,845,960)	(1,446,423)	-
	15,441	October 1, 2015	3.5067	13,209	2,232	-	-
	-	October 1, 2014	3.6043	-	-	-	-
	$ (38,873,866)		3.5702	$ (11,118,114)	$ (10,884,009)	$ (16,871,743)	$ -
2. Assumption Changes	$ -	October 1, 2018	3.3994	$ -	$ -	$ -	$ -
	-	October 1, 2017	3.5571	-	-	-	-
	-	October 1, 2016	3.7836	-	-	-	-
	43,915,338	October 1, 2015	3.8896	33,871,161	10,044,177	-	-
	-	October 1, 2014	3.6043	-	-	-	-
	$ 43,915,338		3.6468	$ 33,871,161	$ 10,044,177	$ -	$ -
3. Difference Between Expected	$ 9,652,923	October 1, 2018	5.0000	$ -	$ 1,930,585	$ -	$ 7,722,338
and Actual Investment Earnings	(28,385,051)	October 1, 2017	5.0000	(5,677,010)	(5,677,010)	(17,031,031)	-
	(6,748,398)	October 1, 2016	5.0000	(2,699,360)	(1,349,680)	(2,699,358)	-
	48,671,807	October 1, 2015	5.0000	29,203,083	9,734,361	-	9,734,363
	(11,080,101)	October 1, 2014	5.0000	(8,864,080)	(2,216,021)	-	-
	$ 12,111,180		5.0000	$ 11,962,633	$ 2,422,235	$ (19,730,389)	$ 17,456,701
4. Total	**$ 17,152,652**			**$ 34,715,680**	**$ 1,582,403**	**$ (36,602,132)**	**$ 17,456,701**

B. Deferred Outflows and Deferred (Inflows) of Resources by Year to be Recognized in Future Pension Expenses

Year Ending September 30	Differences Between Expected and Actual Non-Investment Experience	Assumption Changes	Differences Between Expected and Actual Investment Experience
2019	$ (10,486,704)	$ -	$ 4,638,258
2020	(5,745,643)	-	(5,096,103)
2021	(639,396)	-	(3,746,426)
2022	-	-	1,930,583
2023	-	-	-
Thereafter	-	-	-
Total	**$ (16,871,743)**	**$ 0**	**$ (2,273,688)**

Year Ending September 30	Deferred Outflows of Resources	Deferred (Inflows) of Resources	Net Deferred Outflows/ (Inflows) of Resources
2019	$ 11,664,948	$ (17,513,394)	$ (5,848,446)
2020	1,930,585	(12,772,331)	(10,841,746)
2021	1,930,585	(6,316,407)	(4,385,822)
2022	1,930,583	-	1,930,583
2023	-	-	-
Thereafter	-	-	-
Total	**$ 17,456,701**	**$ (36,602,132)**	**$ (19,145,431)**

SECTION F

SUMMARY OF BENEFITS

Summary of Benefits

The Retirement System was revised effective January 1, 1960, under Ordinance 49623.

Prior to January 1, 1960, there were two groups of members, one group referred to as "Old Plan" and the other group as "New Plan." There is no longer a need for this separation in the active members because the revised system makes no distinction between the "Old Plan" members and the "New Plan" members. The retirees are divided into Old Plan, 1944 Plan (New Plan) and 1960 Plan (Ordinance 49623).

Provisions Attributable to Board Bill 109

First effective with the actuarial valuation as of October 1, 2013, the actuarial valuation reflects the changes attributable to Ordinance 69245, Ordinance 69353, and Judge Dierker's subsequent ruling (Board Bill 109 or BB109). Our understanding of the key changes to the FRS is as follows:

- FRS is frozen as of February 1, 2013. That is, benefits paid from FRS will be based on the member's service and salary earned as of February 1, 2013. Participants with benefit service in FRS are classified as "grandfathered" members.
- Firefighters hired after February 1, 2013, are not members of FRS.
- Vesting and eligibility service earned after February 1, 2013, in the newly established Firemen's Retirement Plan of St. Louis (FRP) will count towards vesting and eligibility service in FRS.
- Ancillary benefits, for pre-retirement death or disability occurring after February 1, 2013, are assumed to be paid from the newly established FRP. FRS members who become disabled or die before retirement are eligible for a refund of contributions made to FRS.
- Employer contributions to the frozen FRS will continue to be calculated under the Frozen Initial Liability cost method.
- Member contributions after February 1, 2013, from "grandfathered" participants in FRS will be paid to the FRP.
- Grandfathered members with 20 or more years of service as of February 1, 2013, are eligible to retire with unreduced FRP benefits if retirement commences before age 55.
- Grandfathered members with less than 20 years of service as of February 1, 2013, are eligible to retire with actuarially reduced FRP benefits if retirement commences before age 55.

Service Retirement

Retirements after June 3, 1978: Voluntary retirement after 20 or more years of service. Compulsory retirement at age 60 with 30 years of service. The monthly retirement allowance consists of 40 percent of the final two-year average monthly compensation at 20 years of service, plus 2.0 percent of such final average compensation for each of the next five years of service (50 percent of final average compensation after 25 years of service), plus 4.0 percent of such final average compensation for each additional year of service over 25 years, but with a maximum of 30 years (70 percent of final average compensation after 30 years of service).

Effective October 3, 1982, any retired firemen may act as a special advisor to the Retirement System and thereby be entitled to a minimum pension of $350.00 per month.

Effective October 1, 1989, any unused accrued sick leave will be added to the years of service used to determine the monthly pension allowance. If the total years of service are limited to 30 years as described above, the unused accrued sick leave will be added to 30.

Effective November 28, 1995, the monthly retirement allowance consists of 40 percent of the final two-year average monthly compensation at 20 years of service, plus 2.0 percent of such final average compensation for each of the next five years of service (50 percent of final average compensation after 25 years of service), plus 5.0 percent of such final average compensation for each additional year of service over 25 years, but with a maximum of 30 years (75 percent of final average compensation after 30 years of service).

Effective July 1, 2002, a Member has three options for use of unused sick leave and service retirement:

- Receive 100 percent of the value (sick leave multiplied by rate of pay) as a lump sum deposit into the DROP account;
- Receive 100 percent of the sick leave as service added to the credited service used in the calculation of the retirement benefit; or
- Receive 50 percent of the value as a lump sum deposit into the DROP account, and receive 25 percent as service added to the credited service used in the calculation of the retirement benefit and receive 25 percent of the value as additional pay solely for purposes of determining the final average earnings used in the calculation of the retirement benefit.

In 2010, the City of St. Louis passed ordinances 67845 and 67846 which effectively ended the practice of firefighters accruing sick leave for retirement benefit purposes. Sick leave accrued prior to September 26, 2010, can be converted to a pension benefit at retirement.

As part of the 2015 Settlement Agreement, accrued sick leave earned through February 1, 2013, can be converted to a pension benefit at retirement.

Ordinary Disability Retirement

Provides a service retirement allowance if 20 or more years of service. Provides for a monthly retirement allowance after five years of service (but less than 20 years) which is the largest of (a) 90 percent of the monthly service retirement allowance based on the actual service or (b) one-fourth of the final two-year average monthly compensation. In addition, a monthly benefit of 10 percent of the final two-year average monthly compensation, for each unmarried dependent child under age eighteen, but not in excess of three children, is provided.

Benefits are paid by FRS if disability occurred prior to February 1, 2013.

Accidental Disability Retirement

Provides for retirement if the member is totally and permanently incapacitated for duty as the result of an accident or exposure occurring while in the actual performance of duty. The monthly retirement allowance is 75 percent of the highest monthly salary in effect for the highest step in the range of salary, for his rank held at retirement.

If the accident immediately, totally and permanently incapacitates the member from performing any type of work and confines him to his home, the Board may provide an increased retirement allowance not to exceed 100 percent of the member's actual rate of compensation as of the date his disability allowance began.

Benefits are paid by FRS if disability occurred prior to February 1, 2013.

DROP Benefit

A member eligible for service retirement may defer receipt of the service retirement benefit for up to five years while continuing active employment. Contributions by the member while in the DROP are one percent of annual compensation. The amount the member would have received as a service retirement benefit is deposited into the DROP account. A member terminating the DROP plan may retire or continue active service. Service while in the DROP will not count as creditable service. Upon termination of employment, the member may choose to receive the DROP account with the interest earned by the account.

Ordinary Death Benefit

Provides for the following benefits after death which occurs:

(1) While in service, a monthly retirement allowance to the widow during widowhood of the greater of (1) 50 percent [a] of the final two-year average monthly compensation or (2) $200. In addition, 10 percent of each unmarried dependent child under age 18 in her care, but not in excess of three children. **Benefits are paid by FRS if death occurred prior to February 1, 2013.**

(2) After service retirement, accidental disability retirement or ordinary disability retirement, a monthly allowance to the widow during widowhood of the greater of (1) 50 percent [a] of the final two-year average monthly compensation, or (2) $200. In addition, 10 percent of such compensation for each unmarried dependent child under 18 in her care but not in excess of three children. **Benefits are paid by FRS if retirement occurred prior to February 1, 2013.**

[a] *Assumes the widow has applied for and been appointed to the status of special consultant; if not the amount is 25 percent.*

Accidental Death Benefit

Provides, if death is the result of an accident or exposure while in the actual performance of duty, a monthly allowance to the widow during her widowhood of the greater of (1) 50 percent of the final two-year average monthly compensation or (2) $200. In addition, 10 percent for each unmarried dependent child under 18 in her care but not in excess of three children. **Benefits are paid by FRS if death occurred prior to February 1, 2013.**

$2,000 Lump Sum Death Benefit

Provides a $2,000 lump sum amount upon the death of an active or retired member. **Lump sum death benefits are paid by FRS if retirement occurred prior to February 1, 2013, or if pre-retirement death occurred prior to February 1, 2013.**

Cost-of-Living Adjustments

(Ordinance 56444) Retirement allowances to members who retired after March 16, 1973, and prior to December 28, 1983, shall be increased 3.0 percent whenever the Consumer Price Index released by the U.S. Department of Labor shows an increase of at least 3.0 percent for three consecutive months in the preceding twelve-month period. Prior to August 31, 1980, each increase was applied to the base retirement benefit at time of retirement. Commencing August 31, 1980, the cost-of-living adjustment is made to the current retirement benefit.

Ordinance 59018 changed the cost-of-living provision for anyone retiring after December 28, 1983. For those members who retired subsequent to December 28, 1983, the cost-of-living increases for service or ordinary disability retirement are based upon the number of years of service at retirement, and are subject to a maximum of the actual increase in the Consumer Price Index over the most recent 12 months.

For a member with less than 25 years of service at retirement, the cost-of-living is 1.5 percent per year up to age 60 and 5.0 percent per year after age 60 with a 25 percent maximum applied past age 60. For a member with at least 25 years of service but less than 30 years at retirement, the cost-of-living increase is 2.25 percent per year up to age 60 and 5.0 percent per year after age 60 with a 25 percent maximum applied past age 60. For a member with 30 or more years of service at retirement, the cost-of-living increase is 3.0 percent per year up to age 60 and 5.0 percent per year after age 60 with a 25 percent maximum applied past age 60. For a member who retires at age 60 or later, the cost-of-living increase is 5.0 percent per year with a 25 percent maximum applied.

For a member who retires with an accidental disability retirement, the cost-of-living increase is 3.0 percent per year up to age 60 and 5.0 percent per year after age 60 with a 25 percent maximum applied past age 60.

Return of Contributions

Upon service retirement, ordinary disability, accidental disability or death of an active member, contributions without interest are refunded. Upon withdrawal from service of a member prior to eligibility for a service retirement allowance, the entire amount of the member’s contributions with interest accumulated is returned to the member in lieu of any other benefits.

SECTION G

ACTUARIAL COST METHOD AND ACTUARIAL ASSUMPTIONS

Actuarial Cost Method

Actuarial Cost Method for GASB Nos. 67 and 68 reporting purposes. The method used in this GASB Statements No. 67 and 68 report is the Entry Age Actuarial Cost Method (EAN). The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

The actuarial accrued liability is equal to the present value of frozen accrued benefits as of February 1, 2013, and DROP balances as of the measurement date.

The actuarial liability is based on frozen benefits and DROP balances provided by FRS. This actuarial valuation assumes FRP will be responsible for benefits due to disability or pre-retirement death occurring after the freeze date.

The Actuarial Cost Method. The method used in the funding valuation is the Frozen Entry Age Actuarial Cost Method. This method determines a normal cost on an aggregate basis expressed as a level percentage of pay. The normal cost rate equals the ratio of (a) the present value of future benefits less the actuarial value of assets less the frozen unfunded actuarial liability, to (b) the present value of future salaries. Under this method, the actuarial gains (losses), as they occur, reduce (increase) future normal costs.

Amortization of Frozen Unfunded Accrued Liabilities. Unfunded actuarial accrued liabilities attributable to changes in assumptions, plan provisions or methods are amortized on a level basis over 30 years from the creation of the unfunded base.

The total contribution is equal to the normal cost plus the amortization of the frozen unfunded accrued liabilities.

Existing frozen unfunded accrued liabilities are fully funded if the actuarial value of assets is greater than the present value of future benefits.

Actuarial Value of Assets. The calculated value is determined by adjusting the market value of assets, excluding the future benefit fund, to reflect the investment gains and losses (the difference between the actual investment return and the expected investment return) during each of the last three years at a rate of 33 percent per year.

Actuarial Valuation Assumptions

For funding purposes, the assumed rate of investment return used was 7.000 percent, net of investment and administrative expenses, annually.

For GASB Statements No. 67 and 68 reporting purposes, the assumed rate of investment return used was 7.300 percent, net of investment expenses.

The post-retirement healthy mortality rates are based on the RP-2014 Healthy Annuitant mortality table, sex distinct. This assumption is used to measure the probabilities of members dying after retirement and the probabilities of each benefit payment being made after retirement. Illustrative rates are shown below. This table provides a margin, of approximately 41 percent based on the most recent experience study, for near-term and long-term mortality improvements.

Post-Retirement Mortality

	Rate Per 1,000 Employees	
Age	**Male**	**Female**
45	2.7430	2.1130
50	4.0640	2.7680
55	5.7350	3.6220
60	7.7710	5.1910
65	11.0130	8.0480
70	16.7690	12.8680
75	26.8260	20.9380
80	44.7220	34.8440
85	77.4970	60.5040

The pre-retirement mortality rates are based on the RP-2014 Employee mortality tables, sex distinct. Illustrative rates are shown below.

Ordinary Pre-Retirement Mortality

	Rate Per 1,000 Employees	
Age	**Male**	**Female**
25	0.4840	0.1730
35	0.5230	0.2860
45	0.9730	0.6570
55	2.7880	1.6730
65	8.2770	3.6960

The post-disability mortality rates are assumed to be 20 percent higher than post-retirement mortality rates. Illustrative rates are shown below.

Post-Disability Mortality Rate Per 1,000 Employees		
Age	**Male**	**Female**
45	3.2916	2.5356
55	6.8820	4.3464
65	13.2156	9.6576
75	32.1912	25.1256
85	92.9964	72.6048

Rates of separation from active membership are represented by the following table (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members terminating employment.

	Employee Withdrawal Rate Per 1,000 Employees
Years of Service	**Rate of Withdrawal**
0	75.0
1	100.0
2	50.0
3	50.0
4	22.5
5	22.5
6	22.5
7	22.5
8	22.5
9	22.5
10	22.5
11	12.5
12	12.5
13	12.5
14	12.5
15	12.5
16	5.0
17	5.0
18	5.0
19	5.0
20 or more	0.0

The annual rates of salary increase used for individual members are shown below and include a wage inflation assumption of 3.00 percent. This assumption is used to project a member's current salary for purposes of determining the present value of future salaries. Because FRS benefits have been frozen as of February 1, 2013, this assumption is not used to determine benefits.

	Salary Increase Assumptions For an Individual Member
Sample Service	Increase Next Year
0	4.00%
1	4.00%
2	4.00%
3	4.00%
4	4.00%
5	3.50%
6	3.50%
7	3.50%
8	3.50%
9	3.50%
10	3.00%
11	3.00%
12	3.00%
13	3.00%
14	3.00%
15 or more	3.00%

The rates of disability for active members are broken out between ordinary and accidental disability. Ordinary disability accounts for 60 percent of total disabilities and accidental disability accounts for 40 percent of total disabilities.

Employee Disablement
Rate Per 1,000 Employees

Age	Ordinary	Accidental
25	3.00	2.00
30	3.00	2.00
35	3.00	2.00
40	6.00	4.00
45	6.00	4.00
50	6.00	4.00
55	6.00	4.00
60	9.00	6.00

Probabilities of retirement for members eligible to retire during the next year were as follows:

Rates of Retirement

Years of Service	Rate of Retirement
20	4.00 %
21	2.00
22	2.00
23	2.00
24	2.00
25	3.00
26	4.00
27	4.00
28	4.00
29	4.00
30	10.00
31	10.00
32	10.00
33	20.00
34	20.00
35 or more	100.00

100% retirement assumed at age 70

It was assumed that grandfathered members with less than 20 years of service as of February 1, 2013, will not retire prior to age 55. The retirement rates for the year the member first becomes eligible at age 55 were increased by 5.00% for each year of service over 20 years.

Marital status varies by gender. A male spouse is assumed to be three years older than a female spouse. One hundred percent of members are assumed to be married.

Sick Leave Benefits. In 2010, the City of St. Louis passed ordinances 67845 and 67846 which effectively ended the practice of firefighters accruing sick leave for retirement benefit purposes. Sick leave accrued prior to September 26, 2010, can still be used for retirement benefit purposes. Based on the 2015 Settlement between FRS and the City, the accrued sick leave balance as of February 1, 2013, can be converted to a pension benefit upon retirement.

It is assumed that the sick leave balance remaining as of the actuarial valuation date will be maintained until the member retires. It is assumed that members will elect to receive 50 percent of the value as a lump sum deposit into the DROP account, and receive 25 percent as service added to the credited service used in the calculation of the retirement benefit and receive 25 percent of the value as additional pay solely for purposes of determining the final average earnings used in the calculation of the retirement benefit.

Furthermore, it is assumed that if a member has not participated in the DROP, the member will participate in the DROP when pension payments commence and the benefit increase and lump sum will be payable four years later at actual retirement. If the member has participated in the DROP and subsequently returned to active service, the benefit increase and lump sum are assumed to be payable immediately upon retirement.

Pursuant to BB109, and subsequent settlement agreements, it is assumed that sick leave benefits do not include salary increases after February 1, 2013.

***Shift Differential**.* No assumption is made for shift differential because it was removed for active members for City fiscal year ending June 30, 2011, and is not expected to be reinstated.

DROP Benefits. It is assumed that members will enter the DROP with 23 years of service. If the member has more than 23 years of service at the actuarial valuation date, it is assumed that the member will enter the DROP the following year. Members with less than 20 years of service as of February 1, 2013, are assumed to enter the DROP at the later of 23 years of service or age 55. It is assumed that members who enter the DROP with less than 30 years of service will return to active status after completing five years in the DROP. DROP balances are assumed to earn 7.625 percent. If a member with a DROP balance dies prior to termination of employment, it is assumed that a lump sum payment equal to the amount in the member's DROP account shall be paid to the beneficiary or the member's estate.

Pursuant to BB109, it is assumed that DROP benefits do not include salary increases after February 1, 2013.

Section H

Calculation of the Single Discount Rate

Calculation of the Single Discount Rate

GASB Statements No. 67 and 68 include specific requirements for the discount rate that is used for the purpose of the measurement of the Total Pension Liability. This rate considers the ability of the fund to meet benefit obligations in the future. To make this determination, employer contributions, employee contributions, benefit payments, expenses and investment returns are projected into the future. The Plan Net Position (assets) in future years can then be determined and compared to its obligation to make benefit payments in those years. As long as assets are projected to be on hand in a future year, the assumed actuarial valuation discount rate is used. In years where assets are not projected to be available or sufficient to meet benefit payments, the use of a "risk-free" rate is required, as described in the following paragraph.

The *Single Discount Rate* (SDR) is equivalent to applying these two rates to the benefits that are projected to be paid during the different time periods. The SDR reflects (1) the long-term expected rate of return on pension plan investments (during the period in which the fiduciary net position is projected to be sufficient to pay benefits) and (2) a tax-exempt municipal bond rate based on an index of 20-year general obligation bonds with an average AA credit rating as of the measurement date (to the extent that the contributions for use with the long-term expected rate of return are not met).

The long-term expected rate of return for the FRS funding is assumed to be 7.000%. Per Statute, this rate is net of both investment and administrative expenses. GASB Statements No. 67 and 68 requires the long-term expected rate of return to be determined net of pension plan investment expense but without reduction for pension plan administrative expense. Administrative expenses are assumed to be approximately 30 basis points; consequently, the long-term expected rate of return used for purposes of GASB Statements No. 67 and 68 is increased by 30 basis points to 7.300%. This rate is gross of administrative expenses.

For the purpose of this actuarial valuation, the expected rate of return on pension plan investments is 7.300%, the municipal bond rate is 3.830%, and the resulting single discount rate is 7.300%.

The following tables show the projection of assets and funded ratios for current members as of the actuarial valuation date.

GASB Statement Nos. 67 and 68

Projection of Assets and Funded Ratio

Plan Year End 10/1	Assets (boy)	Member Contributions	Employer Contributions	Expenses	Benefit Payments	Income on Cash Flow	Assets (eoy)	Present Value of Benefits (eoy)	Funded Ratio (eoy)
2019	$ 477,152,696	$ -	$ -	$ 1,311,296	$ 48,762,172	$ 33,036,656	$ 460,115,884	$ 442,251,084	104%
2020	460,115,884	-	-	1,273,529	40,769,264	32,080,925	450,154,016	432,304,280	104%
2021	450,154,016	-	-	1,247,801	38,612,035	31,431,984	441,726,164	423,865,941	104%
2022	441,726,164	-	-	1,219,218	41,495,129	30,714,396	429,726,212	411,825,129	104%
2023	429,726,212	-	-	1,187,878	39,137,776	29,924,051	419,324,609	401,347,218	104%
2024	419,324,609	-	-	1,153,860	41,826,336	29,069,550	405,413,963	387,319,457	105%
2025	405,413,963	-	-	1,116,577	39,751,553	28,129,805	392,675,638	374,416,847	105%
2026	392,675,638	-	-	1,077,618	41,179,315	27,150,109	377,568,814	359,093,390	105%
2027	377,568,814	-	-	1,036,448	39,395,932	26,112,734	363,249,167	344,498,650	105%
2028	363,249,167	-	-	1,000,233	35,766,133	25,198,853	351,681,655	332,598,448	106%
2029	351,681,655	-	-	966,437	35,969,411	24,348,347	339,094,154	319,618,963	106%
2030	339,094,154	-	-	931,089	35,204,998	23,458,137	326,416,203	306,483,799	107%
2031	326,416,203	-	-	895,236	34,608,029	22,555,338	313,468,277	293,008,143	107%
2032	313,468,277	-	-	859,223	33,581,601	21,648,235	300,675,688	279,611,996	108%
2033	300,675,688	-	-	822,448	33,391,977	20,722,494	287,183,757	265,434,354	108%
2034	287,183,757	-	-	784,027	32,940,873	19,755,136	273,213,993	250,689,024	109%
2035	273,213,993	-	-	746,312	31,046,351	18,804,628	260,225,958	236,829,739	110%
2036	260,225,958	-	-	710,574	29,749,608	17,904,280	247,670,056	223,301,967	111%
2037	247,670,056	-	-	675,793	28,656,648	17,028,137	235,365,752	209,918,817	112%
2038	235,365,752	-	-	641,677	27,607,503	16,168,765	223,285,337	196,645,461	114%
2039	223,285,337	-	-	608,557	26,318,846	15,334,290	211,692,224	183,738,016	115%
2040	211,692,224	-	-	576,186	25,486,753	14,518,990	200,148,275	170,750,256	117%
2041	200,148,275	-	-	544,657	24,171,667	13,724,568	189,156,519	158,176,631	120%
2042	189,156,519	-	-	514,689	22,883,368	12,969,439	178,727,901	146,019,625	122%
2043	178,727,901	-	-	486,152	21,732,835	12,250,428	168,759,343	134,166,946	126%
2044	168,759,343	-	-	459,182	20,420,671	11,570,740	159,450,230	122,808,236	130%
2045	159,450,230	-	-	434,075	19,140,719	10,937,971	150,813,406	111,946,186	135%
2046	150,813,406	-	-	410,801	17,939,072	10,351,405	142,814,939	101,535,943	141%
2047	142,814,939	-	-	389,376	16,737,968	9,811,353	135,498,948	91,609,923	148%

GASB Statement Nos. 67 and 68
Development of single equivalent discount rate

Plan Year End 10/1	Benefit Payments	Discount Rate	Discounted Benefit Payments
2019	$48,762,172	7.300%	$47,074,226
2020	40,769,264	7.300%	36,680,334
2021	38,612,035	7.300%	32,376,015
2022	41,495,129	7.300%	32,426,352
2023	39,137,776	7.300%	28,503,448
2024	41,826,336	7.300%	28,389,082
2025	39,751,553	7.300%	25,145,247
2026	41,179,315	7.300%	24,276,228
2027	39,395,932	7.300%	21,644,808
2028	35,766,133	7.300%	18,313,638
2029	35,969,411	7.300%	17,164,701
2030	35,204,998	7.300%	15,656,963
2031	34,608,029	7.300%	14,344,332
2032	33,581,601	7.300%	12,971,947
2033	33,391,977	7.300%	12,021,154
2034	32,940,873	7.300%	11,051,963
2035	31,046,351	7.300%	9,707,673
2036	29,749,608	7.300%	8,669,342
2037	28,656,648	7.300%	7,782,704
2038	27,607,503	7.300%	6,987,673
2039	26,318,846	7.300%	6,208,298
2040	25,486,753	7.300%	5,602,998
2041	24,171,667	7.300%	4,952,367
2042	22,883,368	7.300%	4,369,447
2043	21,732,835	7.300%	3,867,436
2044	20,420,671	7.300%	3,386,703
2045	19,140,719	7.300%	2,958,459
2046	17,939,072	7.300%	2,584,090
2047	16,737,968	7.300%	2,247,039
2048	15,539,783	7.300%	1,944,255
2058	5,220,063	7.300%	322,840
2068	853,861	7.300%	26,104
2078	101,239	7.300%	1,530
2088	26,308	7.300%	197
2098	5,749	7.300%	21
2108	151	7.300%	-
2118	-	7.300%	-
Total Present Value - October 1, 2018			**$459,237,398**

SECTION I

GLOSSARY OF TERMS

Glossary of Terms

Accrued Service	Service credited under the system which was rendered before the date of the actuarial valuation.
Actuarial Accrued Liability (AAL)	The AAL is the difference between the actuarial present value of all benefits and the actuarial value of future normal costs. The definition comes from the fundamental equation of funding which states that the present value of all benefits is the sum of the Actuarial Accrued Liability and the present value of future normal costs. The AAL may also be referred to as "accrued liability" or "actuarial liability."
Actuarial Assumptions	These assumptions are estimates of future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and compensation increases. Actuarial assumptions are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (compensation increases, payroll growth, inflation and investment return) consist of an underlying real rate of return plus an assumption for a long-term average rate of inflation.
Actuarial Cost Method	A mathematical budgeting procedure for allocating the dollar amount of the actuarial present value of the pension trust benefits between future normal cost and actuarial accrued liability. The actuarial cost method may also be referred to as the actuarial funding method.
Actuarial Equivalent	A single amount or series of amounts of equal actuarial value to another single amount or series of amounts, computed on the basis of appropriate actuarial assumptions.
Actuarial Gain (Loss)	The difference in liabilities between actual experience and expected experience during the period between two actuarial valuations is the gain (loss) on the accrued liabilities.
Actuarial Present Value (APV)	The amount of funds currently required to provide a payment or series of payments in the future. The present value is determined by discounting future payments at predetermined rates of interest and probabilities of payment.
Actuarial Valuation	The actuarial valuation report determines, as of the actuarial valuation date, the service cost, total pension liability and related actuarial present value of projected benefit payments for pensions.
Actuarial Valuation Date	The date as of which an actuarial valuation is performed.

Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)	A calculated contribution into a defined benefit pension plan for the reporting period, most often determined based on the funding policy of the plan. Typically the Actuarially Determined Contribution has a normal cost payment and an amortization payment.
Amortization Method	The method used to determine the periodic amortization payment may be a level dollar amount, or a level percent of pay amount. The period will typically be expressed in years, and the method will either be "open" (meaning, reset each year) or "closed" (the number of years remaining will decline each year.
Amortization Payment	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
Cost-of-Living Adjustments	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)	A multiple-employer defined benefit pension plan in which the pension obligations to the employees of more than one employer are pooled and pension plan assets can be used to pay the benefits of the employees of any employer that provides pensions through the pension plan.
Covered-Employee Payroll	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
Deferred Inflows and Outflows	The deferred inflows and outflows of pension resources are amounts used under GASB Statement No. 68 in developing the annual pension expense. Deferred inflows and outflows arise with differences between expected and actual experiences; changes of assumptions. The portion of these amounts not included in pension expense should be included in the deferred inflows or outflows of resources.
Deferred Retirement Option Program (DROP)	A program that permits a plan member to elect a calculation of benefit payments based on service credits and salary, as applicable, as of the DROP entry date. The plan member continues to provide service to the employer and is paid for the service by the employer after the DROP entry date; however, the pensions that would have been paid to the plan member are credited to an individual member account within the defined benefit pension plan until the end of the DROP period. Other variations for DROP exist and will be more fully detailed in the plan provision section of the actuarial valuation report.

Discount Rate

For GASB purposes, the discount rate is the single rate of return that results in the present value of all projected benefit payments to be equal to the sum of the funded and unfunded projected benefit payments, specifically:

1. The benefit payments to be made while the pension plans' fiduciary net position is projected to be greater than the benefit payments that are projected to be made in the period; and
2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.

Entry Age Actuarial Cost Method (EAN)

The EAN is a funding method for allocating the costs of the plan between the normal cost and the accrued liability. The actuarial present value of the projected benefits of each individual included in an actuarial valuation is allocated on a level basis (either level dollar or level percent of pay) over the earnings or service of the individual between entry age and assumed exit ages(s). The portion of the actuarial present value allocated to a valuation year is the normal cost. The portion of this actuarial present value not provided for at a valuation date by the actuarial present value of future normal costs is the actuarial accrued liability. The sum of the accrued liability plus the present value of all future normal costs is the present value of all benefits.

Fiduciary Net Position

The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.

GASB

The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.

Long-Term Expected Rate of Return

The long-term rate of return is the expected return to be earned over the entire trust portfolio based on the asset allocation of the portfolio.

Money-Weighted Rate of Return

The money-weighted rate of return is a method of calculating the returns that adjusts for the changing amounts actually invested. For purposes of GASB Statement No. 68, money-weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense.

Multiple-Employer Defined Benefit Pension Plan

A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.

Municipal Bond Rate

The Municipal Bond Rate is the discount rate to be used for those benefit payments that occur after the assets of the trust have been depleted.

Net Pension Liability (NPL)

The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan.

Non-Employer Contribution Entities

Non-employer contribution entities are entities that make contributions to a pension plan that is used to provide pensions to the employees of other entities. For purposes of the GASB accounting statements, plan members are not considered non-employer contribution entities.

Normal Cost

The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.

Other Postemployment Benefits (OPEB)

All postemployment benefits other than retirement income (such as death benefits, life insurance, disability, and long-term care) that are provided separately from a pension plan, as well as postemployment healthcare benefits regardless of the manner in which they are provided. Other postemployment benefits do not include termination benefits.

Real Rate of Return

The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.

Service Cost

The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.

Total Pension Expense

The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year:

1. Service Cost
2. Interest on the Total Pension Liability
3. Current-Period Benefit Changes
4. Employee Contributions (made negative for addition here)
5. Projected Earnings on Plan Investments (made negative for addition here)
6. Pension Plan Administrative Expense
7. Other Changes in Plan Fiduciary Net Position
8. Recognition of Outflow (Inflow) of Resources due to Liabilities
9. Recognition of Outflow (Inflow) of Resources due to Assets

Total Pension Liability (TPL)

The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.

Unfunded Actuarial Accrued Liability (UAAL)

The UAAL is the difference between actuarial accrued liability and actuarial valuation assets.

Valuation Assets

The valuation assets are the assets used in determining the unfunded liability of the plan. For purposes of GASB Statements No. 67 and 68, the valuation assets are equal to the market value of assets.