

Firemen's Retirement System of St. Louis

GASB Statement Nos. 67 and 68 Plan Reporting and
Accounting Schedules as of October 1, 2020





January 15, 2021

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, 2020, for additional discussion of the nature of actuarial calculations and more information related to participant data, economic and demographic assumptions, and benefit provisions.

The actuarial valuation as of October 1, 2020, uses actuarial assumptions based on an experience review for the period from October 1, 2014, through September 30, 2018.

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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.

This report was prepared using our proprietary valuation model and related software which in our professional judgment has the capability to provide results that are consistent with the purposes of the valuation. We performed tests to ensure that the model reasonably represents that which is intended to be modeled. We are relying on the GRS actuaries and Internal Software, Training, and Processes Team who developed and maintain the model.

The signing actuaries are independent of the plan sponsor.

Alex Rivera and Jeffrey T. Tebeau 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, FSA, EA, MAAA, FCA
Senior Consultant



Jeffrey T. Tebeau, FSA, EA, MAAA
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, 2020

	2020
Actuarial Valuation Date	October 1, 2020
Pension Plan's Fiscal Year Ending Date (Measurement Date & Reporting Date)	October 1, 2020

Membership

Number of	
- Retirees and Beneficiaries	854
- Active DROP Members	79
- Active Non-DROP Members	395
- Total	1,328
Covered Payroll ¹	\$ 28,364,942

Net Pension Liability

Total Pension Liability	\$ 472,350,844
Plan Fiduciary Net Position ²	434,980,752
Net Pension Liability	\$ 37,370,092
Plan Fiduciary Net Position as a Percentage of Total Pension Liability	92.09%
Net Pension Liability as a Percentage of Covered Payroll	131.75%

Development of the Single Discount Rate

Single Discount Rate Beginning of Year	7.000%
Single Discount Rate End of Year	7.000%
Long-Term Expected Rate of Return	7.000%
Long-Term Municipal Bond Rate Beginning of Year ³	2.75%
Long-Term Municipal Bond Rate End of Year ³	2.41%
Year Plan is projected to be fully funded	2049

GASB No. 68 Pension Expense	\$ 4,799,359
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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	\$ -	\$ (1,603,656)
Changes in assumptions	7,323,705	-
Difference between expected and actual investment earnings	27,912,947	(5,677,011)
Total	\$ 35,236,652	\$ (7,280,667)

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.

Discussion

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, 2020, and a measurement date of October 1, 2020.

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 6.750%. 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 25 basis points; consequently, the long-term expected rate of return used for purposes of GASB Statements No. 67 and 68 is increased by 25 basis points to 7.000%. This rate is gross of administrative expenses.

Discussion

For the purpose of this actuarial valuation, the expected rate of return on pension plan investments is 7.000%, the municipal bond rate is 2.410% (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 7.000%.

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 FRS is projected to be fully funded by 2049. 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, 2020

	<u>2020</u>
Assets	
Investments	
Fixed income	\$ 107,447,109
Equities	235,885,055
Hedge funds	36,354,909
Real estate	47,543,314
Limited partnership units	2,711,137
Money market funds	5,537,648
Total Investments	<u>\$ 435,479,172</u>
Cash and Deposits	\$ 3,930,853
Receivables	
Interest and dividends	\$ 251,322
Unsettled investment transactions	-
Other receivables	385,242
Employer contributions	-
Total Receivables	<u>\$ 636,564</u>
Capital Assets, less Accumulated Depreciation	\$ 294,437
Total Assets	<u>\$ 440,341,026</u>
Deferred Outflows of Resources	
Systems' staff pension related	\$ 98,899
Liabilities	
Payables	
Unsettled investment transactions	\$ 279,840
Accrued investment management fees	264,393
Net pension liability - Systems' staff pension related	290,948
Members contributions refundable	24,528
Accrued administrative expenses	82,211
Due to The Firefighters' Retirement Plan of the City of St. Louis	-
Total Liabilities	<u>\$ 941,920</u>
Deferred Inflows of Resources	
Systems' staff pension related	\$ 5,779
Net Position	<u>\$ 439,492,226</u>
Future Benefit Fund Restricted for SHARE Program	<u>\$ 4,511,474</u>
Net Position Restricted for Pensions	<u>\$ 434,980,752</u>

Statement of Changes in Fiduciary Net Position

As of October 1, 2020

	<u>2020</u>
Additions	
Contributions	
Employer	\$ 1,297,238
Employee	-
Other	-
Total Contributions	<u>\$ 1,297,238</u>
Investment Income	
Net Appreciation in Fair Value of Investments	\$ 15,721,088
Dividends	2,885,376
Interest	2,107,123
Class Action Lawsuit Proceeds	2,874
Securities Lending Income	111,530
Less Investment Expense	<u>(1,492,260)</u>
Net Investment Income	<u>\$ 19,335,731</u>
Other	<u>\$ -</u>
Total Additions	<u>\$ 20,632,969</u>
 Deductions	
Benefit Payments	32,908,833
Benefit Payments SHARE Program	56,070
Refunds of Employee Contributions	1,399,122
Pension Plan Administrative Expense	1,086,499
Other	-
Total Deductions	<u>\$ 35,450,524</u>
 Net Increase in Net Position	 \$ (14,817,555)
 Transfer Out Due to Settlement Agreement	 \$ -
 Net Position	
Beginning of Year	<u>\$ 454,309,781</u>
End of Year	<u><u>\$ 439,492,226</u></u>
 Future Benefit Fund Restricted for SHARE Program	 <u>\$ 4,511,474</u>
 Net Position Restricted for Pensions	 <u><u>\$ 434,980,752</u></u>

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

Schedule of Changes in Net Pension Liability and Related Ratios Multiyear

Fiscal year ending October 1,	2020	2019	2018	2017	2016	2015	2014 - Restated	2014
Total Pension Liability								
Service Cost	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 3,917,882
Interest on the Total Pension Liability	32,070,852	32,252,813	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	(721,053)	(1,287,244)	(5,442,030)	(26,462,974)	(6,984,303)	15,441	-	-
Assumption Changes	-	19,942,113	-	-	-	43,915,338	-	-
Benefit Payments	(32,908,833)	(32,808,908)	(32,161,027)	(32,015,540)	(32,154,888)	(33,561,947)	(34,001,921)	(34,001,921)
Refunds	(1,399,122)	(2,027,172)	(649,093)	(816,435)	(1,278,330)	(1,294,477)	(1,205,393)	(1,205,393)
Net Change in Total Pension Liability	(2,958,156)	16,071,602	(5,522,264)	(24,758,491)	(5,501,406)	43,477,850	(757,677)	4,036,158
Total Pension Liability - Beginning	475,309,000	459,237,398	464,759,662	489,518,153	495,019,559	451,541,709	452,299,386	461,095,233
Total Pension Liability - Ending (a)	\$ 472,350,844	\$ 475,309,000	\$ 459,237,398	\$ 464,759,662	\$ 489,518,153	\$ 495,019,559	\$ 451,541,709	\$ 465,131,391
Plan Fiduciary Net Position								
Employer Contributions	\$ 1,297,238	\$ -	\$ 2,715,141	\$ 3,313,603	\$ 2,715,140	\$ -	\$ 1,007,760	\$ 1,007,760
Employee Contributions	-	-	-	-	-	-	-	-
Pension Plan Net Investment Income	19,147,399	8,307,594	24,519,983	60,390,472	38,228,538	(10,931,763)	48,269,780	48,269,780
Benefit Payments	(32,908,833)	(32,808,908)	(32,161,027)	(32,015,540)	(32,154,888)	(33,561,947)	(34,001,921)	(34,001,921)
Refunds	(1,399,122)	(2,027,172)	(649,093)	(816,435)	(1,278,330)	(1,294,477)	(1,205,393)	(1,205,393)
Pension Plan Administrative Expense	(1,086,499)	(1,027,225)	(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	166,792	166,792	-	(10,278,591)	(10,278,591)
Net Change in Plan Fiduciary Net Position	(14,783,025)	(27,388,919)	(6,458,591)	29,971,266	6,581,917	(47,382,166)	2,367,418	2,367,418
Plan Fiduciary Net Position - Beginning^a	449,763,777	477,152,696	483,611,287	453,640,021	447,058,104	494,440,270	492,221,578	492,221,578
Plan Fiduciary Net Position - Ending (b)	\$ 434,980,752	\$ 449,763,777	\$ 477,152,696	\$ 483,611,287	\$ 453,640,021	\$ 447,058,104	\$ 494,588,996	\$ 494,588,996
Net Pension Liability - Ending (a) - (b)	37,370,092	25,545,223	(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	92.09 %	94.63 %	103.90 %	104.06 %	92.67 %	90.31 %	109.53 %	106.33 %
Covered Employee Payroll	\$ 28,364,942	\$ 28,991,522	\$ 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	131.75 %	88.11 %	(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)%
2019	475,309,000	449,763,777	25,545,223	94.63%	28,991,522	88.11 %
2020	472,350,844	434,980,752	37,370,092	92.09%	28,364,942	131.75 %

Ten fiscal years will be built prospectively.

Schedules of Contributions Multiyear Last Ten 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%
2019	-	-	-	28,991,522	0.00%
2020	1,297,238	1,297,238	-	28,364,942	4.57%

Ten fiscal years will be built prospectively.

Notes to Schedule of Contributions

Valuation Date: October 1, 2020

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	2.50%
Salary Increases ^a	2.75% to 3.75% 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	6.75%, net of investment and administrative expenses
Retirement Age	Experience-based table of rates that are specific to the type of eligibility condition.
Mortality	<p>The post-retirement ordinary mortality rates are based on the Pub-2010 Public Safety Healthy Annuitant mortality table, sex distinct.</p> <p>The pre-retirement mortality rates are based on the Pub-2010 Public Safety Employee mortality tables, sex distinct.</p> <p>The post-disability mortality rates are based on the Pub-2010 Public Safety Disabled Retiree mortality table, sex distinct.</p> <p>Future mortality improvements are reflected by projecting the base mortality tables forward from the year 2010 using the MP-2019 projection scale.</p>

Other Information:

Notes Actuarial valuation as of October 1, 2020, uses actuarial assumptions based on an experience review for the period from October 1, 2014, through September 30, 2018.

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 February 1, 2013.
Discount Rate	7.00% as of the October 1, 2019, actuarial valuation. 7.00% as of the October 1, 2020, 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 Ten Fiscal Years

FY Ending October 1,	Annual Return¹
2013	14.41 %
2014	10.32 %
2015	(2.42)%
2016	9.20 %
2017	14.69 %
2018	5.82 %
2019	1.80 %
2020	4.69 %

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

Calculated by FRS. Ten 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 and Asset Allocation

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, 2020. The assumed rate of investment return was most recently analyzed in the experience review for the period October 1, 2014, through September 30, 2018.

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 system's target asset allocation as of October 1, 2020, these best estimates are summarized in the following table:

Asset Allocation

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Core Bonds	5.00%	2.60%
Core Plus	22.00%	2.87%
Absolute Return	3.00%	4.25%
US Large Cap Equity	18.00%	7.14%
US Small Cap Equity	8.00%	8.43%
International Developed Equity	17.00%	8.14%
Emerging Market Equity	5.00%	9.48%
Long/Short Equity	7.00%	5.46%
Core Real Estate	10.00%	6.73%
Value Add Real Estate	5.00%	8.23%
Total	100.00%	

The above long-term expected real rates of return represent best estimates of arithmetic rates of return for each major asset class included. These rates of return are shown net of inflation and net of investment expenses.

Target asset allocation and long-term expected real rates of return provided by the System's investment consultant, Asset Consulting Group.



Sensitivity of Net Pension Liability to the Single Discount Rate Assumption

Single Discount Rate

A single discount rate of 7.000% 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 7.000%. 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 7.000%, 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

Current Single Discount		
1% Decrease	Rate Assumption	1% Increase
6.000%	7.000%	8.000%
\$81,125,300	\$37,370,092	\$212,217

Summary of DROP Accounts as of the Actuarial Valuation Date

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.

	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
2019	76	5,206,955	55	11,540,173	107	20,498,486	238	37,245,614
2020	79	5,709,756	59	12,301,904	110	21,212,077	248	39,223,737

Summary of Population Statistics

Inactive Plan Members or Beneficiaries Currently Receiving Benefits	854
Active Plan Members Currently in the DROP	79
Active Plan Members	<u>395</u>
Total Plan Members	1,328

Additional information about the member data used can be found in the October 1, 2020, funding actuarial valuation report.

SECTION E

GASB STATEMENT NO. 68 PENSION EXPENSE

Net Pension Liability for Fiscal Year Ending October 1, 2020

A. Total pension liability		
1. Service Cost	\$	-
2. Interest on the Total Pension Liability		32,070,852
3. Changes of benefit terms		-
4. Difference between expected and actual experience		(721,053)
5. Changes of assumptions		-
6. Benefit payments		(32,908,833)
7. Refunds of employee contributions		(1,399,122)
8. Net change in total pension liability	\$	(2,958,156)
9. Total Pension liability - beginning (October 1, 2019)		475,309,000
10. Total Pension liability - ending (October 1, 2020)	\$	472,350,844
B. Plan fiduciary net position		
1. Contributions – employer	\$	1,297,238
2. Contributions – employee		-
3. Net investment income		19,147,399
4. Benefit payments, including refunds of employee contributions		(34,307,955)
5. Pension Plan Administrative Expense		(1,086,499)
6. Transfer (Out)/In Due to Settlement Agreement		166,792
7. Net change in plan fiduciary net position	\$	(14,783,025)
8. Plan fiduciary net position - beginning (October 1, 2019)		449,763,777
9. Plan fiduciary net position - ending (October 1, 2020)	\$	434,980,752
C. Net pension liability as of October 1, 2020	\$	37,370,092
D. Plan fiduciary net position as a percentage of the total pension liability		92.09%
E. Covered-employee payroll	\$	28,364,942
F. Net pension liability as a percentage of covered employee payroll		131.75 %

Pension Expense for Fiscal Year Ending October 1, 2020

A. Expense

1. Service Cost	\$ -
2. Interest on the Total Pension Liability	32,070,852
3. Current-Period Benefit Changes	-
4. Employee Contributions (made negative for addition here)	-
5. Projected Earnings on Plan Investments (made negative for addition here)	(30,295,900)
6. Pension Plan Administrative Expense	1,086,499
7. Other Changes - Transfer Due to Settlement Agreement	(166,792)
8. Recognition of Outflow (Inflow) due to Liability Experience	(6,382,427)
9. Recognition of Outflow (Inflow) due to Assumption Changes	6,309,204
10. Recognition of Outflow (Inflow) due to Investment Experience	2,177,923
11. Total Pension Expense	\$ 4,799,359

B. Reconciliation of Net Pension Liability

1. Net Pension Liability beginning of year	\$ 25,545,223
2. Pension Expense	4,799,359
3. Employer Contributions	(1,297,238)
4. Change in Deferred Liability Experience (Inflows)/Outflows	5,661,374
5. Change in Deferred Assumption Changes (Inflows)/Outflows	(6,309,204)
6. Change in Deferred Investment Experience (Inflows)/Outflows	8,970,578
7. Net Pension Liability end of year	\$ 37,370,092

Statement of Outflows and Inflows Arising from Current and Prior Reporting Periods for Fiscal Year ending October 1, 2020

A. Outflows and (Inflows) of Resources Recognized in Current and Future Pension Expenses as of Fiscal Year End October 1, 2020

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 and Actual Non-Investment Experience	\$ (721,053)	October 1, 2020	3.1414	\$ -	\$ (229,531)	\$ (491,522)	\$ -
	(1,287,244)	October 1, 2019	3.1608	(407,253)	(407,253)	(472,738)	-
	(5,442,030)	October 1, 2018	3.3994	(3,201,756)	(1,600,878)	(639,396)	-
	(26,462,974)	October 1, 2017	3.5571	(22,318,209)	(4,144,765)	-	-
	(6,984,303)	October 1, 2016	3.7836	(6,984,303)	-	-	-
	<u>\$ (40,897,604)</u>			<u>\$ (32,911,521)</u>	<u>\$ (6,382,427)</u>	<u>\$ (1,603,656)</u>	<u>\$ -</u>
2. Assumption Changes	\$ -	October 1, 2020	3.1414	\$ -	\$ -	\$ -	\$ -
	19,942,113	October 1, 2019	3.1608	6,309,204	6,309,204	-	7,323,705
	-	October 1, 2018	3.3994	-	-	-	-
	-	October 1, 2017	3.5571	-	-	-	-
	-	October 1, 2016	3.7836	-	-	-	-
	<u>\$ 19,942,113</u>			<u>\$ 6,309,204</u>	<u>\$ 6,309,204</u>	<u>\$ -</u>	<u>\$ 7,323,705</u>
3. Difference Between Expected and Actual Investment Earnings	\$ 11,148,501	October 1, 2020	5.0000	\$ -	\$ 2,229,700	\$ -	\$ 8,918,801
	25,221,630	October 1, 2019	5.0000	5,044,326	5,044,326	-	15,132,978
	9,652,923	October 1, 2018	5.0000	3,861,170	1,930,585	-	3,861,168
	(28,385,051)	October 1, 2017	5.0000	(17,031,030)	(5,677,010)	(5,677,011)	-
	(6,748,398)	October 1, 2016	5.0000	(5,398,720)	(1,349,678)	-	-
	<u>\$ 10,889,605</u>			<u>\$ (13,524,254)</u>	<u>\$ 2,177,923</u>	<u>\$ (5,677,011)</u>	<u>\$ 27,912,947</u>
4. Total	<u>\$ (10,065,886)</u>			<u>\$ (40,126,571)</u>	<u>\$ 2,104,700</u>	<u>\$ (7,280,667)</u>	<u>\$ 35,236,652</u>

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	Year Ending September 30	Deferred Outflows of Resources	Deferred (Inflows) of Resources	Net Deferred Outflows/ (Inflows) of Resources
2021	\$ (1,276,180)	\$ 6,309,204	\$ 3,527,600	2021	\$ 15,513,815	\$ (6,953,191)	\$ 8,560,624
2022	(295,016)	1,014,501	9,204,609	2022	10,219,110	(295,016)	9,924,094
2023	(32,460)	-	7,274,026	2023	7,274,026	(32,460)	7,241,566
2024	-	-	2,229,701	2024	2,229,701	-	2,229,701
2025	-	-	-	2025	-	-	-
Thereafter	-	-	-	Thereafter	-	-	-
Total	<u>\$ (1,603,656)</u>	<u>\$ 7,323,705</u>	<u>\$ 22,235,936</u>	Total	<u>\$ 35,236,652</u>	<u>\$ (7,280,667)</u>	<u>\$ 27,955,985</u>



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. 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 fireman 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.



Summary of Benefits

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.

Summary of Benefits

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.

Summary of Benefits

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.

Summary of Benefits

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.

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 Assumptions

The Board adopts the assumptions after consultation with the actuary. All actuarial assumptions are expectations of future experience and are not market measures. The rationale for the actuarial assumptions may be found in the experience study report covering the period October 1, 2014, through September 30, 2018.

Interest

For funding purposes, the assumed rate of investment return used was 6.75 percent per year, compounded annually, net of investment and administrative expenses, annually.

For GASB Statements No. 67 and 68 reporting purposes, the assumed rate of investment return used was 7.00 percent, net of investment expenses, and includes an administrative expense assumption of 25 basis points.

General Inflation

2.50 percent per year, compounded annually.

This assumption serves as the basis for the determination of annual increases that are equal to the annual increase in the Consumer Price Index-U during the preceding 12-month calendar year.

Actuarial Assumptions

Mortality

Mortality assumptions for employees and retirees are as follows:

Applicable Group	Base Mortality Table
Pre-retirement	Pub-2010 Public Safety Employee, sex distinct
Post-retirement	Pub-2010 Public Safety Healthy Retiree, sex distinct
Post-disability	Pub-2010 Public Safety Disabled Retiree, sex distinct

Future mortality improvements are reflected by projecting the base mortality tables forward from the year 2010 using the MP-2019 projection scale.

Illustrative rates are shown below.

Sample Mortality Rates								
	Future Life Expectancy (years) in 2020				Future Life Expectancy (years) in 2035			
	Post-retirement		Disabled - Retiree		Post-retirement		Disabled - Retiree	
Age	Male	Female	Male	Female	Male	Female	Male	Female
35	51.24	53.43	49.03	51.30	52.66	54.82	50.61	52.87
40	45.97	48.11	44.05	46.26	47.36	49.49	45.57	47.78
45	40.75	42.82	39.08	41.23	42.11	44.19	40.55	42.72
50	35.59	37.59	34.12	36.22	36.93	38.94	35.56	37.68
55	30.51	32.47	29.25	31.35	31.83	33.80	30.65	32.78
60	25.63	27.57	24.58	26.77	26.89	28.85	25.91	28.10
65	21.02	22.93	20.24	22.45	22.20	24.11	21.46	23.66
70	16.73	18.52	16.20	18.31	17.79	19.61	17.28	19.41
75	12.80	14.43	12.47	14.40	13.74	15.43	13.42	15.40

Actuarial Assumptions

Termination

Rates of separation are represented by the following table. This assumption measures the probabilities of members terminating employment.

Employee Withdrawal Rate Per 1,000 Employees	
Years of Service	Number of Withdrawals
0	75.0
1	100.0
2	50.0
3	50.0
4	22.5
5	12.5
6	12.5
7	12.5
8	12.5
9	12.5
10	12.5
11	12.5
12	12.5
13	12.5
14	12.5
15	10.0
16	5.0
17	5.0
18	5.0
19	5.0
20 or more	0.0

It is assumed that terminated employees will not be rehired. The rates do not apply to members eligible to retire and do not include separation on account of death or disability.

Actuarial Assumptions

Salary Increases

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.

Illustrative rates of increase per individual employee per year, compounded annually:

Salary Increase Assumptions For an Individual Member	
Sample Service	Increase Next Year
0	3.75%
1	3.75%
2	3.75%
3	3.75%
4	3.75%
5	3.25%
6	3.25%
7	3.25%
8	3.25%
9	3.25%
10	2.75%
11	2.75%
12	2.75%
13	2.75%
14	2.75%
15 or more	2.75%

The underlying salary increase assumption is based on a wage inflation assumption of 2.75 percent per year, comprised of 2.50 percent for general inflation plus 0.25 percent for productivity increases. The rates shown above include wage inflation plus an age-based component for merit, promotion, and longevity.

Actuarial Assumptions

Disability

The rates of disability for active members are broken out between ordinary and accidental disability. Ordinary disability accounts for 20 percent of total disabilities and accidental disability accounts for 80 percent of total disabilities. Illustrative rates of disability from the plan are as follows for members:

Employee Disablement Number Per 1,000 Employees		
Age	Ordinary	Accidental
25	0.50	2.00
30	1.00	4.00
35	1.00	4.00
40	1.50	6.00
45	1.50	6.00
50	1.50	6.00
55	1.50	6.00
60	1.50	6.00

Rates of disability are based on the disability rates used by FRP which were updated in an experience study for the period October 1, 2013, through September 30, 2017, performed by the actuary for FRP (Cheiron).

Actuarial Assumptions

Retirement

Employees are assumed to retire in accordance with the rates shown below. The rates apply only to employees who have fulfilled the service requirement necessary for retirement at any given age.

Rates of Retirement	
Years of Service	Rate of Retirement
20	5.00 %
21	2.00
22	2.00
23	2.00
24	2.00
25	3.00
26	3.00
27	3.00
28	3.00
29	3.00
30	7.50
31	7.50
32	7.50
33	15.00
34	15.00
35 or more	100.00

100 percent 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 percent for each year of service over 20 years.

Actuarial Assumptions

DROP Benefits

Members are assumed to enter the DROP with 26 years of service. If the member has more than 26 years of service at the actuarial valuation date, the member is assumed to 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 26 years of service or age 55.

Members who enter the DROP with less than 30 years of service are assumed to return to active status after completing five years in the DROP.

DROP balances are assumed to earn 6.75 percent per year.

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 is paid to the beneficiary or the member's estate.

DROP distribution rates for current retired members with DROP balances:

- 4.50 percent distribution per year from retirement age to age 72;
- 5.00 percent distribution at age 73 increasing by 0.50 percent per year to 11.00 percent at age 85; and
- 12.00 percent at age 86 increasing by 1.00 percent per year.

DROP distribution rates for members who retire in the future with DROP balances are based on a uniform 30-year distribution rate upon retirement.

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

Actuarial Assumptions

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.

The frozen sick leave balance as of February 1, 2013, is assumed to be utilized by the member at a rate of 3.0 percent per year.

Members are assumed to convert unused sick leave balances at retirement in to a pension benefit and receive:

- 50 percent of the value as a lump sum deposit into the DROP account;
- 25 percent as service added to the credited service used in the calculation of the retirement benefit; and
- 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.

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

Marriage Assumption

100.0 percent of active participants are assumed to be married. Actual marital status at benefit commencement is used for retirees.

Spouse's Age

For members whose spouse information is not provided, the female spouse is assumed to be three years younger than the male spouse for valuation purposes.

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.

Administrative Expenses

Administrative expenses are assumed to be approximately 25 basis points.

Actuarial Assumptions

Decrement Timing

All decrements are assumed to occur mid-year.

Decrement Relativity

Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.

Decrement Operation

Turnover decrements do not operate after a member reaches retirement eligibility.

Eligibility Testing

Eligibility for benefits is determined based upon the age nearest birthday and service on the date the decrement is assumed to occur.

415(b) and 401(a)(17) Limits

No explicit assumption is made with respect to these items.

Actives with Missing Data

For active members whose pay was not provided, pay was assumed to be equal to their 2018 pay.

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 6.750%. 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 25 basis points; consequently, the long-term expected rate of return used for purposes of GASB Statements No. 67 and 68 is increased by 25 basis points to 7.000%. This rate is gross of administrative expenses.

For the purpose of this actuarial valuation, the expected rate of return on pension plan investments is 7.000%, the municipal bond rate is 2.410%, and the resulting single discount rate is 7.000%.

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

Projection of Assets and Funded Ratio

Plan Year End 9/30	Accrued Liability			Total				Frozen			Expected Salary	Present Value of Future Salary	
	Assets (boy)	Normal Contribution	Amortization Payment	Employer Contributions	Expenses	Benefit Payments	Income on Cash Flow	Assets (eoy)	Present Value of Benefits (eoy)	Funded Ratio (eoy)			Unfunded Liability
2021	\$ 434,980,752	\$ 2,105,960	\$ 1,297,238	\$ 3,403,198	\$ 1,009,090	\$ 34,913,177	\$ 29,212,638	\$ 431,674,321	\$ 479,098,553	90%	\$ 16,132,210	\$ 33,328,923	\$ 233,858,191
2022	431,674,321	3,877,498	1,297,238	5,174,736	999,030	36,624,963	28,922,635	428,147,699	473,596,834	90%	15,923,896	31,191,885	214,064,992
2023	428,147,699	4,247,019	1,297,238	5,544,257	991,297	35,970,692	28,698,549	425,428,516	468,399,740	91%	15,701,521	30,038,048	195,217,035
2024	425,428,516	4,142,954	1,297,239	5,440,193	982,296	37,981,150	28,439,340	420,344,603	460,774,639	91%	15,464,134	27,638,856	176,328,568
2025	420,344,603	3,864,396	1,297,238	5,161,634	969,964	38,018,610	28,082,602	414,600,265	452,596,141	92%	15,210,725	25,645,674	158,726,275
2026	414,600,265	3,636,310	1,297,239	4,933,549	953,938	39,791,228	27,620,057	406,408,705	442,034,127	92%	14,940,210	22,814,240	142,063,546
2027	406,408,705	3,282,100	1,297,238	4,579,338	934,302	39,657,908	27,051,911	397,447,744	430,896,923	92%	14,651,437	20,446,906	127,298,633
2028	397,447,744	2,984,089	1,297,239	4,281,328	914,104	38,450,302	26,466,890	388,831,555	420,255,654	93%	14,343,170	19,571,029	114,064,217
2029	388,831,555	2,897,574	1,297,238	4,194,812	892,951	38,722,561	25,855,117	379,265,972	408,614,802	93%	14,014,096	18,035,245	100,871,477
2030	379,265,972	2,712,181	1,297,239	4,009,420	870,105	38,497,428	25,194,058	369,101,917	396,420,801	93%	13,662,808	16,795,854	88,427,674
2031	369,101,917	2,567,384	1,297,238	3,864,622	845,713	38,353,854	24,488,354	358,255,325	383,552,044	93%	13,287,810	15,421,255	76,466,963
2032	358,255,325	2,399,098	1,297,239	3,696,337	820,092	37,862,727	23,746,873	347,015,717	370,322,079	94%	12,887,498	14,189,557	65,166,296
2033	347,015,717	2,249,613	1,297,238	3,546,851	793,073	37,742,219	22,965,176	334,992,453	356,323,600	94%	12,460,166	12,591,009	54,417,675
2034	334,992,453	2,038,160	1,297,239	3,335,399	764,192	37,596,014	22,129,572	322,097,218	341,531,282	94%	12,003,988	10,403,604	44,649,966
2035	322,097,218	1,722,252	1,297,238	3,019,490	734,136	36,677,597	21,259,541	308,964,516	326,689,390	95%	11,517,019	9,110,937	36,557,988
2036	308,964,516	1,542,860	1,297,239	2,840,099	703,348	35,889,668	20,368,422	295,580,022	311,659,759	95%	10,997,179	7,954,180	29,299,721
2037	295,580,022	1,380,634	1,297,238	2,677,872	671,961	35,094,359	19,459,952	281,951,525	296,437,338	95%	10,442,251	6,900,349	22,786,376
2038	281,951,525	1,231,274	1,297,239	2,528,513	640,023	34,267,349	18,535,512	268,108,179	281,041,871	95%	9,849,863	5,685,964	16,958,335
2039	268,108,179	1,047,620	1,297,238	2,344,858	607,796	33,249,249	17,602,618	254,198,609	265,659,109	96%	9,217,491	4,925,137	12,033,249
2040	254,198,609	941,740	1,297,239	2,238,979	575,105	32,482,405	16,656,458	240,036,536	250,030,313	96%	8,542,433	3,451,731	7,587,911
2041	240,036,536	694,160	1,297,238	1,991,398	542,155	31,425,510	15,702,613	225,762,882	234,438,557	96%	7,821,809	2,391,339	4,415,370
2042	225,762,882	510,750	1,297,239	1,807,989	508,996	30,318,213	14,742,698	211,486,360	218,938,414	97%	7,052,542	1,599,288	2,160,655
2043	211,486,360	371,319	1,297,238	1,668,557	475,780	29,252,040	13,781,169	197,208,265	203,493,581	97%	6,231,351	599,260	599,260
2044	197,208,265	175,958	1,297,239	1,473,197	442,700	28,070,672	12,823,489	182,991,579	188,226,810	97%	5,354,728	-	-
2045	182,991,579	-	1,297,238	1,297,238	409,813	26,852,178	11,871,379	168,898,204	173,188,478	98%	4,418,934	-	-
2046	168,898,204	-	1,297,239	1,297,239	377,211	25,644,637	10,927,513	155,101,109	158,382,689	98%	3,419,973	-	-
2047	155,101,109	-	1,297,238	1,297,238	345,355	24,411,976	10,005,226	141,646,242	143,851,093	98%	2,353,583	-	-
2048	141,646,242	-	1,297,238	1,297,238	314,353	23,157,328	9,107,622	128,579,420	129,634,916	99%	1,215,212	-	-
2049	128,579,420	-	1,297,238	1,297,238	284,304	21,889,838	8,237,591	115,940,107	115,768,716	100%	-	-	-
2050	115,940,107	-	-	-	255,296	20,616,240	7,397,659	102,466,231	102,282,427	100%	-	-	-

Employer contributions and present value of benefits shown above are based on the funding policy and a discount rate assumption of 6.75%.

The expected return on assets of 7.00% is net of investment expenses.

Administrative expenses are based on 0.25% of the average asset value during the year.



Development of Single Discount Rate

Plan Year End 10/1	Benefit Payments	Discount Rate	Discounted Benefit Payments
2021	\$34,913,177	7.000%	\$33,751,842
2022	36,624,963	7.000%	33,090,363
2023	35,970,692	7.000%	30,373,116
2024	37,981,150	7.000%	29,972,633
2025	38,018,610	7.000%	28,039,433
2026	39,791,228	7.000%	27,426,890
2027	39,657,908	7.000%	25,546,726
2028	38,450,302	7.000%	23,148,424
2029	38,722,561	7.000%	21,787,227
2030	38,497,428	7.000%	20,243,510
2031	38,353,854	7.000%	18,848,611
2032	37,862,727	7.000%	17,389,954
2033	37,742,219	7.000%	16,200,567
2034	37,596,014	7.000%	15,082,065
2035	36,677,597	7.000%	13,751,057
2036	35,889,668	7.000%	12,575,373
2037	35,094,359	7.000%	11,492,248
2038	34,267,349	7.000%	10,487,317
2039	33,249,249	7.000%	9,510,032
2040	32,482,405	7.000%	8,682,894
2041	31,425,510	7.000%	7,850,818
2042	30,318,213	7.000%	7,078,682
2043	29,252,040	7.000%	6,382,946
2044	28,070,672	7.000%	5,724,454
2045	26,852,178	7.000%	5,117,725
2046	25,644,637	7.000%	4,567,833
2047	24,411,976	7.000%	4,063,805
2048	23,157,328	7.000%	3,602,754
2049	21,889,838	7.000%	3,182,767
2050	20,616,240	7.000%	2,801,483
2060	7,013,306	7.000%	484,466
2070	1,291,309	7.000%	45,345
2080	165,462	7.000%	2,954
2090	36,692	7.000%	333
2100	11,637	7.000%	54
2110	731	7.000%	2
2120	2	7.000%	0
Total Present Value - October 1, 2020			\$472,350,844

SECTION I

GLOSSARY OF TERMS

Glossary of Terms

<i>Accrued Service</i>	Service credited under the system which was rendered before the date of the actuarial valuation.
<i>Actuarial Accrued Liability (AAL)</i>	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."
<i>Actuarial Assumptions</i>	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.
<i>Actuarial Cost Method</i>	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.
<i>Actuarial Equivalent</i>	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.
<i>Actuarial Gain (Loss)</i>	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.
<i>Actuarial Present Value (APV)</i>	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.
<i>Actuarial Valuation</i>	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.
<i>Actuarial Valuation Date</i>	The date as of which an actuarial valuation is performed.

Glossary of Terms

<i>Actuarially Determined Contribution (ADC) or Annual Required Contribution (ARC)</i>	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.
<i>Amortization Method</i>	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).
<i>Amortization Payment</i>	The amortization payment is the periodic payment required to pay off an interest-discounted amount with payments of interest and principal.
<i>Cost-of-Living Adjustments</i>	Postemployment benefit changes intended to adjust benefit payments for the effects of inflation.
<i>Cost-Sharing Multiple-Employer Defined Benefit Pension Plan (cost-sharing pension plan)</i>	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.
<i>Covered-Employee Payroll</i>	The payroll of covered employees, which is typically only the pensionable pay and does not include pay above any pay cap.
<i>Deferred Inflows and Outflows</i>	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.
<i>Deferred Retirement Option Program (DROP)</i>	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.

Glossary of Terms

<i>Discount Rate</i>	<p>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:</p> <ol style="list-style-type: none">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; and2. The present value of the benefit payments not in (1) above, discounted using the municipal bond rate.
<i>Entry Age Actuarial Cost Method (EAN)</i>	<p>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.</p>
<i>Fiduciary Net Position</i>	<p>The fiduciary net position is the market value of the assets of the trust dedicated to the defined benefit provisions.</p>
<i>GASB</i>	<p>The Governmental Accounting Standards Board is an organization that exists in order to promulgate accounting standards for governmental entities.</p>
<i>Long-Term Expected Rate of Return</i>	<p>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.</p>
<i>Money-Weighted Rate of Return</i>	<p>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.</p>
<i>Multiple-Employer Defined Benefit Pension Plan</i>	<p>A multiple-employer plan is a defined benefit pension plan that is used to provide pensions to the employees of more than one employer.</p>
<i>Municipal Bond Rate</i>	<p>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.</p>
<i>Net Pension Liability (NPL)</i>	<p>The NPL is the liability of employers and non-employer contribution entities to plan members for benefits provided through a defined benefit pension plan.</p>

Glossary of Terms

<i>Non-Employer Contribution Entities</i>	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.
<i>Normal Cost</i>	The actuarial present value of the pension trust benefits allocated to the current year by the actuarial cost method.
<i>Other Postemployment Benefits (OPEB)</i>	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.
<i>Real Rate of Return</i>	The real rate of return is the rate of return on an investment after adjustment to eliminate inflation.
<i>Service Cost</i>	The service cost is the portion of the actuarial present value of projected benefit payments that is attributed to a valuation year.
<i>Total Pension Expense</i>	<p>The total pension expense is the sum of the following items that are recognized at the end of the employer's fiscal year:</p> <ol style="list-style-type: none">1. Service Cost2. Interest on the Total Pension Liability3. Current-Period Benefit Changes4. Employee Contributions (made negative for addition here)5. Projected Earnings on Plan Investments (made negative for addition here)6. Pension Plan Administrative Expense7. Other Changes in Plan Fiduciary Net Position8. Recognition of Outflow (Inflow) of Resources due to Liabilities9. Recognition of Outflow (Inflow) of Resources due to Assets
<i>Total Pension Liability (TPL)</i>	The TPL is the portion of the actuarial present value of projected benefit payments that is attributed to past periods of member service.
<i>Unfunded Actuarial Accrued Liability (UAAL)</i>	The UAAL is the difference between actuarial accrued liability and actuarial valuation assets.
<i>Valuation Assets</i>	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.