PUBLIC SCHOOL RETIREMENT SYSTEM
OF THE CITY OF ST. LOUIS

MINUTES OF THE BOARD OF TRUSTEES REGULAR MEETING

June 18, 2018

I. ROLL CALL AND ANNOUNCEMENT OF A QUORUM

The June meeting of the Board of Trustees of the Public School Retirement System of the City of St. Louis (PSRSSTL) was called to order at 4:30 p.m., Monday, June 18, 2018. The meeting was held in the 2nd floor boardroom of the PSRSSTL office building located at 3641 Olive Street, St. Louis, Missouri. Joseph Clark, Chairman of the Board of Trustees, was the presiding officer.

Roll Call was taken and Trustees Angela Banks, Christina Bennett, Paula Bentley, Joseph Clark, Darnetta Clinkscale, Louis Cross and Rick Sullivan were present. The Board of Trustees had a quorum at the meeting. Trustee Bobbie Richardson joined the meeting in progress. Trustees Sheila Goodwin and Yvette Levy were absent.

Executive Director, Andrew Clark, Accounting Specialist, Terry Mayes, PSRSSTL Attorney Representative, Matt Gierse, PSRSSTL Actuary Representatives, Troy Jaros and Matthew Mantia, and several interested parties were also in attendance.

II. APPROVAL OF MINUTES FROM LAST MEETING

Angela Banks made a motion, seconded by Rick Sullivan, to approve the minutes of the Board of Trustees Regular Meeting of April 16, 2018.

By voice vote, motion carried.

III. READING OF COMMUNICATIONS TO THE BOARD OF TRUSTEES

None

IV. PRESENTATIONS BY INTERESTED PARTIES

Active Member, Rose Bruce, expressed concern over time allotted for member appointments and asked that consideration be given to expanding the hours to better accommodate working SLPS employees. The Chairman thanked the member for her comments.

V. CONSENT AGENDA

Louis Cross made a motion, seconded by Angela Banks, to approve the Retirements and Benefits of May and June 2018.

By voice vote, motion carried.

Christina Bennett made a motion, seconded by Darnetta Clinkscale, to approve the Refunds and Bills of April and May 2018.

By voice vote, motion carried.

VI. UNFINISHED BUSINESS

Trustee Sullivan apologized to the Board of Trustees for his conduct at the last meeting.

VII. REPORT OF THE CHAIRPERSON

None; however, the Chairman was questioned on the Professional Contracts Committee Chair vacancy and the status of the Investment Consulting Services RFP still being considered by that Committee. The discussion continued until the Chairman stated he would appoint a new Chair and the RFP process would continue.

VIII. REPORT OF THE EXECUTIVE DIRECTOR

The Executive Director reported on Trustee travel by stating all Trustees are eligible to travel and that all outstanding travel vouchers had been resolved. The Trustees were informed that the 10-year lease of office space to the Department of Veterans Affairs will expire in May 2019 and that the property manager CBRE will be assisting with the lease renewal. The Executive Director reported about the Active Non-Teacher Trustee vacancy created upon Mr. Thomas' separation from employment. The term for the vacant Trustee position is set to expire on December 31, 2018, and the regular election process to fill the vacancy should begin in the next couple of months. To save on election costs, the Executive Director suggested that the Trustees elect not to hold a special election to fill the current vacancy. The discussion continued on the election until all questions and issues were addressed by the Executive Director.

Rick Sullivan made a motion, seconded by Darnetta Clinkscale, to waive a special election of an Active Non-Teacher Trustee.

By voice vote, motion carried.

IX. REPORT OF THE INVESTMENT CONSULTANT

None

X. REPORT OF THE ACTUARY

The Actuary presented the results of the 2018 Actuarial Valuation Report by reviewing a discussion document. The Actuary presented findings on the system's member census information and demographics; the system's assets, liabilities and funding ratios; and the annual required contributions (ARC) for the St. Louis Public Schools Board of Education, PSRSSTL and the Charter Schools. The Actuary reported on the legislative / statutory changes made in 2017 and the effects on this year's valuation because of them. There was extended discussion on the system's actuarial methodology after a suggestion from the Actuary that it might be time to change the methodology to better reflect the changes. A suggestion was made to hold a meeting to discuss possible changes to the system's actuarial methodology. The discussion continued until questions and issues from the Trustees were addressed by the Actuary.

Christina Bennett made a motion, seconded by Louis Cross, to adopt the 2018 Actuarial Valuation Report as presented by the Actuary.

By voice vote, motion carried.

XI. REPORTS OF COMMITTEES OF THE BOARD OF TRUSTEES

The Chairman asked for reports from the Committees.

Benefits Committee

Louis Cross, Chair of the Committee stated that a meeting should be scheduled to address retiree insurance benefits.

Trustee Business Committee

None

Investment Committee

Joe Clark, Chair of the Committee, reported on the meeting of May 17, 2018, and informed the Trustees that one recommendation was being brought forward by the Committee for consideration by the Board of Trustees.

Christina Bennett made a motion, seconded by Paula Bentley, to liquidate the Entrust Capital Diversified Fund QP, Ltd., with exception of the Gramercy Fund position held in the investment, as recommended by the investment Committee.

A roll call vote was taken.

Angela Banks	Yes	Christina Bennett	Yes	Paula Bentley	Yes
Joseph Clark	Yes	Louis Cross	Yes	Darnetta Clinkscale	Yes
Bobbie Richardson	Yes	Rick Sullivan	Yes		

With eight yes votes, motion carried.

The Chair reminded the Trustees of the upcoming Investment Committee meeting on June 21, 2018.

Legislative, Rules & Regulations Committee

None

Professional Contracts Committee

None

XII. NEW BUSINESS

None

XIII. REPORT OF THE ATTORNEY

The Attorney Representative suggested that the meeting should be closed to discuss a legal matter.

Louis Cross made a motion, seconded by Darnetta Clinkscale, to close the meeting pursuant to R.S.Mo. §610.021(1), to discuss a legal matter with the Attorney.

A roll call vote was taken.

Angela Banks	Yes	Christina Bennett	Yes	Paula Bentley	Yes
Joseph Clark	Yes	Louis Cross	Yes	Darnetta Clinkscale	Yes
Bobbie Richardson	Yes	Rick Sullivan	Yes		

With eight yes votes, motion carried, and the meeting closed around 5:55 p.m.

No decisions were made during the closed portion of the meeting.

Christina Bennett made a motion, seconded by Angela Banks, to open the meeting.

A roll call vote was taken.

Angela Banks	Yes	Christina Bennett	Yes	Paula Bentley	Yes
Joseph Clark	Yes	Louis Cross	Yes	Darnetta Clinkscale	Yes
Bobbie Richardson	Yes	Rick Sullivan	Yes		

With eight yes votes, motion carried, and the meeting opened at around 6:13 p.m.

XIV. ADJOURNMENT

Rick Sullivan made a motion, seconded by Paula Bentley, to adjourn the meeting.

By voice vote, motion carried, and the meeting adjourned at around 6:14 p.m.

Attachments:

Retirements Paid: May and June 2018
Refunds & Bills Paid: April and May 2018
Report on Trustee Travel Expenses: Calendar Years 2016 and 2018
2018 Actuarial Valuation Report and Results
2018 GASB Statement Nos. 67 & 68 from Actuary

To be Authorized and Approved
by the Board of Trustees

APPLICATIONS FOR RETIREMENT

NAME \ POSITION	RETIREMENT DATE	RETIREMENT TYPE	CREDITED SERVICE	FINAL AVG SALARY	MONTHLY BENEFIT
Aaron Craig Teacher	4/1/2018	Normal	20.6469	$69,492.15	$2,391.33
Pamela Donaldson Teacher Assistant	4/1/2018	Normal	30.0000	$35,702.61	$1,785.13
Cassie Gorecki Teacher	4/1/2018	Disability	8.5222	$50,087.86	$852.54
Felecia Hickman Teacher	4/1/2018	Normal	13.4112	$37,110.67	$829.50
Linda Isaac Special Education Process Coordinator	4/1/2018	Normal	30.0000	$87,113.97	$3,475.85
Robin Purdy Teacher	4/1/2018	Normal	27.6351	$67,929.74	$3,128.74

To be Authorized and Approved
by the Board of Trustees

APPLICATIONS FOR RETIREMENT

NAME \ POSITION	RETIREMENT DATE	RETIREMENT TYPE	CREDITED SERVICE	FINAL AVG SALARY	MONTHLY BENEFIT
Karla Gayfield Instructional Technology Spec	5/1/2018	Normal	18.8904	$70,590.19	$2,222.46
Melody Hodges Teacher	5/1/2018	Normal	27.2222	$68,376.77	$3,102.27
Emma Osby Teacher	5/1/2018	Normal	28.9500	$67,605.48	$3,261.96
Mihline Zahoran Teacher	5/1/2018	Disability	19.7778	$69,729.62	$2,298.50

Distributions - April, 2018

CHECK NUMBER	CHECK DATE	LAST NAME	FIRST NAME/MI	GROSS PAY	FEDERAL TAXES W/H	NET PAY	A(ctive) R(etired)	D(eath) S(eparation)	NOTES
073816	02/08/18	TAYLOR	COLLEEN	(1,876.02)		(1,876.02)	A	S	PREC VOID AND REISSUE
073940	03/22/18	EDMOND	CLEVELAND	(50,000.00)		(50,000.00)	A	S	VOID AND REISSUE
073970	04/06/18	EDMOND	JAMES F	8,243.45	1,648.69	6,594.76	A	S	CA
073971	04/06/18	HILL	JESSIE	405.69	81.14	324.55	A	S	CA
073972	04/06/18	MILLER	JOHNNY	1,329.69	265.94	1,063.75	A	S	CA
073973	04/06/18	MURRAY	SONYA	46,292.42	9,258.48	37,033.94	A	S	CA
073974	04/06/18	SCAIFE	MARCEL	1,074.84	214.97	859.87	A	S	KIPP
073975	04/06/18	SINCLAIR	HOLLY	8,657.56		8,657.56	A	S	LFL
073976	04/06/18	WARD	SARAH E	1,899.74		1,899.74	A	S	EAGLE
073977	04/06/18	YOUNG	JAMES	2,913.75	582.75	2,331.00	A	S	CA
073978	04/06/18	ZACHARY	ALEXANDRIA	1,223.80	244.76	979.04	A	S	KIPP
073979	04/06/18	ALLEN	CANDACE	460.76	92.15	368.61	A	S	
073980	04/06/18	DIXON	TRACI A	1,012.54	202.51	810.03	A	S	
073981	04/06/18	EDWARDS	ROMNEY	25,733.56	5,146.71	20,586.85	A	S	
073982	04/06/18	KEMPF	SAMANTHA J	5,594.58	1,118.92	4,475.66	A	S	
073983	04/06/18	MCCRAY	EDWARD	9,150.33	1,830.07	7,320.26	A	S	
073984	04/06/18	MCROY	JOY	2,506.72	501.34	2,005.38	A	S	PADIEA
073985	04/06/18	NELSON	DENISE	7,316.07	1,463.21	5,852.86	A	S	
073986	04/06/18	PARKER	PAMELA	88,587.78	17,717.56	70,870.22	A	S	
073987	04/06/18	WALSER	SALLY A	18,079.34		18,079.34	A	S	
073988	04/06/18	WASHINGTON	TANYUA	3,894.95	778.99	3,115.96	A	S	
073989	04/06/18	KASMI	SYED HA	5,373.90		5,373.90	A	S	DEC: S KAZMI
073990	04/06/18	TAYLOR	COLLEEN	1,876.02	375.20	1,500.82	A	S	PREC VOID AND REISSUE
073991	04/06/18	EDMOND	CLEVELAND	35,000.00		35,000.00	A	S	VOID AND REISSUE
073992	04/06/18	EDMOND	CLEVELAND	15,000.00	3,000.00	12,000.00	A	S	VOID AND REISSUE
073993	04/19/18	HALL	LAUREN	2,485.66		2,485.66	A	S	HLSG
073994	04/19/18	MAYES	D'ANTAY	1,466.62	293.32	1,173.30	A	S	CA
073995	04/19/18	NORRIS	SANDRA	906.92	181.38	725.54	A	S	NSCS
073996	04/19/18	STAMBORSKI	DANIEL J	5,544.22	1,108.84	4,435.38	A	S	LFL
073997	04/19/18	KENZIE	SARA	10,421.15		10,421.15	A	S	GCAA BAL OF CONTRIB
073998	04/19/18	KARR	MARK	3,163.09	632.62	2,530.47	A	S	IESM BAL OF CONTRIB
073999	04/19/18	RUBRIGHT	DANIEL	5,481.74		5,481.74	A	S	ACQ-GC BAL OF CONTRIB
074000	04/19/18	HARPS	KIMBERLY	2,412.27	482.45	1,929.82	A	S	JAMAA BAL OF CONTRIB
074001	04/19/18	MILLETT	ERICA	4,973.73		4,973.73	A	S	JAMAA BAL OF CONTRIB
074002	04/19/18	MAJOR	DAMON	995.08	199.02	796.06	A	S	KIPP BAL OF CONTRIB
074003	04/19/18	CLARK	RACHEL	13,878.01		13,878.01	A	S	

Distributions - April, 2018

CHECK NUMBER	CHECK DATE	LAST NAME	FIRST NAME/MI	GROSS PAY	FEDERAL TAXES W/H	NET PAY	A(ctive) R(etired)	D(eath) S(eparation)	NOTES
074004	04/19/18	CLEMONS	VOLANDA	1,037.25	207.45	829.80	A	S	
074005	04/19/18	COLLINS	JILLIANS	1,246.19	249.24	996.95	A	S	
074006	04/19/18	FUNK	MICHAEL W	37,733.75	7,546.75	30,187.00	A	S	
074007	04/19/18	MCKINNEY	CRYSTAL	5,263.06	1,052.61	4,210.45	A	S	
074008	04/19/18	MILLETT	JASMINE	1,557.06	311.41	1,245.65	A	S	
074009	04/19/18	O BRIEN	STEPHANIE	7,857.47		7,857.47	A	S	
074010	04/19/18	TIGUE	LISA	7,043.44	1,408.69	5,634.75	A	S	
			TOTAL	$ 353,218.18	$ 58,197.17	$ 295,021.01			

Distributions - May, 2017

CHECK NUMBER	CHECK DATE	LAST NAME	FIRST NAME/MI	GROSS PAY	FEDERAL TAXES W/H	NET PAY	A(ctive) R(etired)	D(eath) S(eparation)	NOTES
074035	05/03/18	GRANT	AMBER	1,372.98	274.60	1,098.38	A	S	KIPP
074036	05/03/18	LIU	XIAONA	700.42	140.08	560.34	A	S	SLLIS
074037	05/03/18	MACARTHUR	KERI	1,588.88	317.78	1,271.10	A	S	SLLIS
074038	05/03/18	MCNAMARA	VICKI	9,969.00	1,993.80	7,975.20	A	S	PRECLARUS & SLLIS
074039	05/03/18	WOOD	EMILY	705.05	141.01	564.04	A	S	LIFT FOR LIFE
074040	05/03/18	BRADSHAW	MEAGHANN	2,503.38		2,503.38	A	S	
074041	05/03/18	BROMBERG	MARA	10,309.12		10,309.12	A	S	
074042	05/03/18	EUBANKS	PAMELA	2,915.35	583.07	2,332.28	A	S	
074043	05/03/18	IVORY	MAURICE	4,152.05	830.41	3,321.64	A	S	
074044	05/03/18	LAYNE	ADAM	8,688.74	1,737.75	6,950.99	A	S	
074045	05/03/18	NORRIS	TRAVIS	512.18		512.18	A	S	
074046	05/03/18	PERKINS	AARON	461.83	92.37	369.46	A	S	
074093	05/18/18	BARNES	ANTOINETTE	2,191.12	438.22	1,752.90	A	S	PRECLARUS
074094	05/18/18	DIXON	RACHEL	1,557.42	311.48	1,245.94	A	S	THE BIOME
074095	05/18/18	EFE	YALCIN	9,031.26	1,806.25	7,225.01	A	S	GSA
074096	05/18/18	HADLEY	CHANTAY	5,479.42	1,095.88	4,383.54	A	S	HLSG
074097	05/18/18	RECTOR	LAURA	70.71		70.71	A	S	LFL
074098	05/18/18	WRIGHT	ALEXIS	561.47	112.29	449.18	A	S	KIPP
074099	05/18/18	BARNETT	KATHLEEN	12,019.25		12,019.25	A	S	
074100	05/18/18	CARTER	MATTHEW	9,292.47	1,858.50	7,433.97	A	S	
074101	05/18/18	CASON	TIERRA	3,471.27	694.25	2,777.02	A	S	
074102	05/18/18	GLOSCHAT	LANA	5,289.82		5,289.82	A	S	
074103	05/18/18	SUTHERLAND	BRANDICE	2,401.93	480.39	1,921.54	A	S	
074104	05/18/18	WALLER	ESTHER	706.58	141.32	565.26	A	S	
			TOTAL	**$ 95,951.70**	**$ 13,049.45**	**$ 82,902.25**			

Public School Retirement System of the City of St. Louis
Checks Written During the Month of April, 2018

Payee	Ck. Number	Description	Amount
Date Paid April 5, 2018			
Ameren Missouri	73954	Electric Service	2,269.96
AT&T	73955	U-Verse Internet	65.98
Windstream Communications	73956	Telephone, Data	584.04
Anders CPAs & Advisors	73957	Audit of Financial Statements	13,900.00
MVP Security LLC - SRG	73958	April 2018 Parking - 2 Employees	130.00
BuildingStars STL Operations, Inc.	73959	Janitorial Services	1,386.00
Blade Technologies, Inc.	73960	Professional Services	1,170.00
OffsiteDataSync	73961	Online Backups	259.88
Gregory F.X. Daly, Collector of Revenue	73962	City Earnings Tax - First Quarter 2018	1,067.40
Gregory F.X. Daly, Collector of Revenue	73963	Water - City	115.66
Purchase Power	73964	Postage	1,000.00
Tech Electronics, Inc.	73965	Maintenance on Security Camera and Alarms	630.00
Tom Kinealy	73966	Efax Renewal, Microsoft Office License Renewal	291.99
Board of Education St. Louis Benefits Trust	73967	Office Employees Insurance - Dental	212.33
Board of Education St. Louis Benefits Trust	73968	Office Employees Insurance - Vision	15.55
Board of Education St. Louis Benefits Trust	73969	Office Employees Insurance - Life	87.35
Date Paid April 13, 2018			
Office Payroll	ACH	Office Payroll	10,663.77
AXA Equitable	ACH	457 Contributions	2,245.00
Date Paid April 20, 2018			
AT&T	74011	Monthly Service Charge	151.30
Blade Technologies, Inc.	74012	Professional Services	2,069.84
Crossroads Courier, Inc.	74013	Courier Service	7.22
Hartnett Gladney Hetterman, L.L.C.	74014	Legal Fees	13,489.00
Gallagher Benefit Services, Inc.	74015	Group Ins. Consulting Services Monthly Fee	3,320.25
Charter Communications	74016	Charter Internet and Voice	192.80
Jupiter Consulting Services, LLC	74017	Programming Consulting	1,953.00
Anders CPAs & Advisors	74018	Audit of Financial Statements	26,000.00
Specialty Mailing	74019	Postage - Daily Pickup	380.00
Specialty Mailing	74020	Service - Winter Newsletter, 2018	987.60
The Berwyn Group	74021	Death Check Verification Services	125.00
Minuteman Press	74022	Business Cards	180.00
GCI Security, Inc.	74023	Security Guard 04/16/2018	144.00
UPS	74024	UPS Delivery	120.95
Chicago Equity Partners, LLC	74025	1st Quarter 2018 Management Fee	41,845.31
EARNEST Partners, LLC	74026	1st Quarter 2018 Management Fee	7,616.10
Mellon Capital Management Corporation	74027	1st Quarter 2018 Management Fee	65,065.02
Mellon Capital Management Corporation	74028	1st Quarter 2018 Management Fee	929.76
Piedmont Investment Advisors, LLC	74029	1st Quarter 2018 Management Fee	8,593.48
Systematic Financial Management, LP	74030	1st Quarter 2018 Management Fee	74,493.59
TCW Asset Management Company	74031	1st Quarter 2018 Management Fee	54,312.46
Date Paid April 27, 2018			
Office Payroll	ACH	Office Payroll	10,663.77
Office Payroll	74032	Office Payroll	1,127.27
AXA Equitable	ACH	457 Contributions	2,245.00
Diana S. Daugherty, Chapter 13 Trustee	74033	Case No. xx-xx907	555.00
		TOTAL	**$352,662.63**

Public School Retirement System of the City of St. Louis
Checks Written During the Month of May, 2018

Payee	Ck. Number	Description	Amount
Date Paid May 1, 2018			
Notary Public Underwriters Agency, Inc.	74034	Notary Bond and Supplies for Robin Willis	89.49
Date Paid May 4, 2018			
Ameren Missouri	74047	Electric Service	2,110.22
AT&T	74048	U-Verse Internet	65.98
Windstream Communications	74049	Telephone, Data	584.19
Office Essentials	74050	Office Supplies	1,333.32
Anders CPAs & Advisors	74051	Audit of Financial Statements	1,900.00
BuildingStars STL Operations, Inc.	74052	Janitorial Services and Supplies	2,211.15
OffsiteDataSync	74053	Online Backups	259.88
Purchase Power	74054	Postage	564.42
MSD	74055	Sewer Service	48.29
BarnesCare	74056	Mihline Zahoran	100.00
Absopure Water Company	74057	Water Cooler Service	32.85
Arthur J Gallagher Risk Mgmt Services, Inc.	74058	Fiduciary Liability & Crime Insurance Premiums	75,025.00
Shred-It	74059	Document Shredding	195.13
Nexcess	74060	Web Hosting Renewal	143.40
Stockell Consulting	74061	Employee Placement Services	17,800.00
Robin Willis	74063	Notary Renewal	26.25
CBRE - 608844	74064	Management Fee - April 2018	1,138.47
CBRE - 608844	74065	Engineering Services	602.85
St. Louis Mat & Linen Company	74066	Floor Mats	172.50
Delta Pest Stl Inc.	74067	Pest Control	50.00
Causeway Capital Management LLC	74068	1st Quarter 2018 Management Fee	83,723.66
The Edgar Lomax Company	74069	1st Quarter 2018 Management Fee	43,446.87
INTECH Investment Management LLC	74070	1st Quarter 2018 Management Fee	33,872.38
Fidelity Institutional Asset Mgmt Trust Company	74071	1st Quarter 2018 Management Fee	76,474.29
Manulife Asset Management U.S. LLC	74072	1st Quarter 2018 Management Fee	31,909.57
Progress Investment Management Co., LLC	74073	1st Quarter 2018 Management Fee	87,000.92
US Bank	74074	1st Quarter 2018 Custodial Fee	30,241.99
Board of Education St. Louis Benefits Trust	74075	Office Employees Insurance - Dental	238.71
Board of Education St. Louis Benefits Trust	74076	Office Employees Insurance - Vision	17.10
Board of Education St. Louis Benefits Trust	74077	Office Employees Insurance - Life	143.15
Date Paid May 11, 2018			
Office Payroll	ACH	Office Payroll	12,957.33
AXA Equitable	ACH	457 Contributions	2,245.00
Republic Services #346	74078	Trash Pick-Up	299.29
Birch Grove Software	74079	Software	345.60
Date Paid May 21, 2018			
Absopure Water Company	74105	Water Cooler Service	125.70
AT&T	74106	Monthly Service Charge	149.93
Blade Technologies, Inc.	74107	Professional Services	1,428.34
Crossroads Courier, Inc.	74108	Courier Service	6.01
Hartnett Gladney Hetterman, L.L.C.	74109	Legal Fees	15,427.75
Gallagher Benefit Services, Inc.	74110	Group Ins. Consulting Services Monthly Fee	3,320.25
Charter Communications	74111	Charter Internet and Voice	189.96
Jupiter Consulting Services, LLC	74112	Programming Consulting	6,363.00
Specialty Mailing	74113	Postage - Daily Pickup	210.00
Specialty Mailing	74114	Postage - Spring Newsletter, 2018	2,163.04
The Berwyn Group	74115	Death Check Verification Services	5.00
Office Essentials	74116	Office Supplies	129.46
MSD	74117	Sewer Service	48.29
Conduent HR Consulting, LLC	74118	Acturial & Consulting Services - March/April 2018	30,682.00

Public School Retirement System of the City of St. Louis
Checks Written During the Month of May, 2018

Payee	Ck. Number	Description	Amount
MVP Security LLC - SRG	74119	May 2018 Parking - 2 Employees	130.00
Pitney Bowes, Inc.	74120	Postage Supplies	153.42
Microtek Document Imaging Systems, Inc.	74121	Convert InfoPort Images & Data, Scanning	3,162.20
Tiffany Jones	74122	Tuition Reimbursement	1,372.50
CBRE - 608844	74123	Management Fee - May 2018	1,138.47
CBRE - 608844	74124	Engineer Services	421.75
St. Louis Mat & Linen Company	74125	Floor Mats	138.00
Westfield Capital Management Company, LP	74126	1st Quarter 2018 Management Fee	67,753.05
Date Paid May 25, 2018			
Office Payroll	ACH	Office Payroll	12,957.34
AXA Equitable	ACH	457 Contributions	2,245.00
Bobbie Richardson	74127	Advance - NASP Conference	1,243.19
NASP	74128	NASP Registration - Bobbie Richardson	150.00
Diana S. Daugherty, Chapter 13 Trustee	74129	Case No. xx-xx907	555.00
		TOTAL	**$659,037.90**

Public School Retirement System of the City of St. Louis
Travel Activity and Expenses - Calendar Year 2016

NAME	SPONSOR	DATES FROM	DATES TO	LOCATION	ADVANCES TO	REIMBURSEMENTS TO	REIMBURSEMENTS FROM	TOTAL COST	EXP RPT	VOUCHER STATUS*	NOTES
Bennett, Christina	NASP	06/12/2016	06/15/2016	Atlanta, GA		$1,636.22		$1,636.22	Y	Approved	Monday, December 19, 2016
Bentley, Paula	NASP	06/12/2016	06/15/2016	Atlanta, GA	$1,770.00	$236.09		$2,006.09	Y	Approved	Monday, December 19, 2016
	MAPERS	07/11/2016	07/13/2016	Osage Beach, MO	$958.76	$5.43		$964.19	Y	Approved	Monday, December 19, 2016
	NCTR	07/24/2016	07/27/2016	Berkley, CA	$1,769.00	$3.13		$1,772.13	Y	Approved	Monday, December 19, 2016
Goodwin, Sheila	NEPC	05/09/2016	05/11/2016	Boston, MA		$2,111.55		$2,111.55	Y	Approved	Monday, December 19, 2016
	NASP	06/13/2016	06/15/2016	Atlanta, GA		$2,058.31		$2,058.31	Y	Approved	Monday, December 19, 2016
	MAPERS	07/11/2016	07/13/2016	Osage Beach, MO		$905.74		$905.74	Y	Approved	Monday, December 19, 2016
	NCTR	07/24/2016	07/27/2016	Berkley, CA		$2,197.70		$2,197.70	Y	Approved	Monday, December 19, 2016
	NCTR	10/08/2016	10/12/2016	Providence, RI		$2,428.90		$2,428.90	Y	Approved	Monday, December 19, 2016
Levy, Yvette	NEPC	05/09/2016	05/11/2016	Boston, MA	$1,475.00	$6.33		$1,481.33	Y	Approved	Monday, December 19, 2016
	NASP	06/13/2016	06/15/2016	Atlanta, GA	$2,000.00		$84.63	$1,915.37	Y	Pending	Received reimbursement 4-17-18
Moten, John	NEPC	05/09/2016	05/11/2016	Boston, MA		$1,446.52		$1,446.52	Y	Approved	Monday, December 19, 2016
	NASP	06/12/2016	06/15/2016	Atlanta, GA		$1,011.88		$1,011.88	Y	Approved	Monday, December 19, 2016
Shelton, Charles	NEPC	05/09/2016	05/11/2016	Boston, MA	$1,921.00	$441.40		$2,362.40	Y	Approved	Monday, December 19, 2016
	NASP	06/13/2016	06/15/2016	Atlanta, GA	$1,422.97	$388.73		$1,811.70	Y	Approved	Monday, December 19, 2016
	NCTR	10/08/2016	10/12/2016	Providence, RI	$2,080.00	$340.43		$2,420.43	Y	Approved	Monday, December 19, 2016
Thomas, Eural	NASP	06/12/2016	06/15/2016	Atlanta, GA		$1,698.36		$1,698.36	Y	Approved	Monday, December 19, 2016
							Total Cost	$30,228.82			

MAPERS - Missouri Association of Public Employees Retirement Systems
NASP - National Association of Securities Professionals
NCTR - National Council on Teacher Retirement
NEPC - New England Pension Consultants

*Pending = pending board approval

As of 4/17/2018

Public School Retirement System of the City of St. Louis
Travel Activity and Expenses - Calendar Year 2018

NAME	SPONSOR	DATES FROM	DATES TO	LOCATION	ADVANCES TO	REIMBURSEMENTS TO	REIMBURSEMENTS FROM	TOTAL COST	EXP RPT	VOUCHER STATUS*	NOTES
Bentley, Paula	MAPERS	07/25/2018	07/27/2018	Osage Beach, MO							
Goodwin, Sheila	NEPC	05/13/2018	05/16/2018	Boston, MA							
Richardson, Bobbie	NASP	06/03/2018	06/06/2018	Houston, TX	$1,243.19			$1,243.19		Pending	
							Total Cost	$1,243.19			

MAPERS - Missouri Association of Public Employees Retirement Systems
NASP - National Association of Securities Professionals
NCTR - National Council on Teacher Retirement
NEPC - New England Pension Consultants

*Pending = pending board approval

As of 6/6/2018

Public School Retirement System of the City of St. Louis, Missouri

Public School Retirement System of the City of St. Louis Retirement Plan

Actuarial Valuation Report

Plan Year	January 1, 2018 – December 31, 2018

June 2018

CONDUENT
231 S. Bemiston, Suite 400
St. Louis, MO 63105

June 2018

Mr. Andrew Clark
Executive Director
PSRS of the City of St. Louis
3641 Olive Street, Suite 300
St. Louis, MO 63108-3601

Re: Actuarial Certification of January 1, 2018 Valuation

Dear Members of the Public School Retirement System of the City of St. Louis Board:

The annual actuarial valuation required for the Public School Retirement System of the City of St. Louis ("System") has been prepared as of January 1, 2018 by Conduent. The purposes of the valuation are to:

(1) determine the required annual contributions from the board of education, the retirement system, and the charter schools; and

(2) present the valuation results of the System as of January 1, 2018.

This report is submitted in accordance with Section 169.450-16 Revised Statutes of Missouri (R.S. Mo.). The required contribution to the System from the board of education, the retirement system, and the charter schools is computed in accordance with Section 169.490 R.S. Mo. The amount of the required contribution is stated in Section 1.3 of this report. Information with respect to financial disclosures under GASB 67 and 68 may be found in a separate report.

In preparing this valuation, we have employed generally accepted actuarial methods and assumptions, in conjunction with employee data and financial information provided to us by the System, to determine a reasonable and sound value for the System liability. The employee data has not been audited, but it has been reviewed and found to be consistent, both internally and with prior years' data. The validity of the valuation results is dependent upon the accuracy of the data and financial information provided.

In my opinion, the actuarial assumptions used are reasonable, taking into account the experience of the System and reasonable long-term expectations, and represent my best estimate of the anticipated long-term experience under the System. The actuary performs an analysis of System experience periodically and recommends changes if, in the opinion of the actuary, assumption changes are needed to more accurately reflect expected future experience. The Experience Study for the period January 1, 2011 to December 31, 2015 was prepared by Conduent and approved by the Board for use beginning with the January 1, 2017 actuarial valuation and will remain in effect for valuation purposes until such time as the Board adopts revised assumptions. The next Experience Study will be based on the period from January 1, 2016 to December 31, 2020 and upon approval by the Board will be the basis of valuations performed from January 1, 2022 through January 1, 2026. A summary of all assumptions and methods is presented in Section 3.8 of this report.

Where presented, references to “funded ratio” and “unfunded accrued liability” typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Future actuarial measurements and contribution requirements may differ from those determined in the valuation because of:

(1) differences between actual experience and anticipated experience based on the assumptions;

(2) changes in actuarial assumptions or methods;

(3) changes in statutory provisions;

(4) differences between actuarially required contributions and actual contributions.

The undersigned meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein, and is available to answer questions regarding this report.

I believe that the assumptions and methods used for funding purposes are individually and in aggregate, reasonable and in combination represent a best estimate of anticipated experience under the plan. I believe that this report conforms with the requirements of the Missouri statutes, and where applicable, other federal and accounting laws, regulations and rules, as well as actuarial principles and practices in accordance with all applicable Actuarial Standards of Practice (ASOPs).

Sincerely,

Troy Jaros, FSA, EA, MAAA, FCA
Senior Consultant, Retirement Actuary

Conduent HR Services

Table of Contents

Report Highlights

This report has been prepared by Conduent to:

- Present the results of a valuation of the Public School Retirement System of the City of St. Louis ("System") as of January 1, 2018; and
- Determine the required annual contribution for 2019.

This report is divided into three sections. Section 1 contains the results of the valuation. It includes the experience of the System during the 2017 plan year, the actuarially required costs, and funded levels.

Section 2 contains asset information. It includes market value of assets, the calculation of actuarial value of assets, the contingency reserve, and asset returns.

Section 3 describes the basis of the valuation. It summarizes the System provisions, provides information relating to the System members, and describes the funding methods and actuarial assumptions used in determining liabilities and costs. Also included is historical information about the System.

Experience Gains and Losses

Under the actuarial funding method used to determine the contribution, actuarial gains (or losses) result in a decrease (or increase) in the normal cost rate. Actuarial gains (or losses) result from differences between the actual experience of the System and the expected experience based upon the actuarial assumptions. Annual gains (or losses) should be expected because short-term deviations from expected long-term average experience are common.

For the 2017 plan year, total (net) actuarial losses due to plan experience were $25.9 million. Approximately $4.1 million is a loss attributable to the System's actuarial rate of return on assets which was 6.9%, or 0.6% lower than the assumed rate of return of 7.5% for plan year 2017. By comparison, the rate of return on the market value of assets during plan year 2017 was 15.2%. The difference in these returns is due to the asset smoothing. Market value returns were higher than expected, but these returns are smoothed over 5 years in the actuarial value, rather than realized immediately. As of January 1, 2018, the actuarial value of assets of $899.8 million is above market value of assets (excluding the expense and contingency reserve) by approximately $16.5 million.

An actuarial loss of approximately $21.8 million attributable to demographic experience is included in the above total (net) actuarial loss of $25.9 million.

Assumption Changes

For the 2018 valuation, no assumptions were changed. A detailed description of the assumptions appears in section 3.8.

Plan Changes

For the 2018 valuation, the normal pension eligibility requirement was changed from Rule of 85 to Rule of 80 due to legislation that was passed on August 28, 2017. This Plan change increased the January 1, 2018 actuarial accrued liability by approximately $16.8 million. There were other Plan changes, as described in section 3.2, but they had no impact on the January 1, 2018 actuarial accrued liability since they are prospective in nature.

Normal cost rate

The normal cost is determined annually and equals the product of the normal cost rate times covered payroll. For plan year 2018, the annual normal cost contribution is $21,038,975, as compared to $26,350,187 for plan year 2017. This decrease is primarily due to the legislative changes in future employee contributions. The annual normal cost rate decreased from 9.76% to 7.63% due to the legislative changes. Covered payroll increased from $260.2 million to $265.8 million.

Accrued liability amortization

The actuarial accrued liability contribution is determined as the amount necessary to amortize the remaining Unfunded Frozen Actuarial Accrued Liability (UFAAL) over a period of 30 years from January 1, 2006, when the Board of Trustees acted to redetermine the UFAAL. This portion of the contribution only changes to reflect changes in benefits, changes in actuarial assumptions and methods, and variations in the remaining UFAAL due to deviations between actual and expected contributions. Employer contributions for 2017 were $1.4 million more than the annual required contribution, which reduced the UFAAL more than expected. However, the legislative changes increased the UFAAL by $16.8 million. As a result, the net amortization payment increased from $23,343,402 to $26,057,188. The amortization payment component of the contribution rate increased from 9.0% to 9.8% of covered payroll.

Required contribution and timing

In 2001, the Board of Education agreed to institute a one-year lag for payments of the annual required contributions due from SLPS for future years. Therefore, this actuarial valuation is used to determine the annual required contribution (ARC) payment from SLPS for plan year 2018, due to the Plan no later than December 31, 2019. Due to legislation passed August 28, 2017, the contribution rate is set as a fixed percentage rather than an actuarially determined percentage. Because of the statutory required contribution rate, the dollar amount of the ARC due from SLPS no later than December 31, 2019, decreased to $31,344,663 for plan year 2018 from $37,376,323 for plan year 2017.

As a percentage of covered payroll in plan year 2018, the contribution rate for plan year 2018 decreased to 16.00% from 19.10% for plan year 2017. Charter Schools pay both employer and employee contributions as they occur shortly after each payroll period; therefore, this actuarial valuation is used to determine the contribution rate of 16.00% that Charter Schools should be paying beginning with payroll periods ending on or after January 1, 2018.

According to the 2018 Actuarial Valuation Results and timing of payments found in this report, it is important to note that on an actuarially determined and sound basis, SLPS and the Charter Schools should be paying an annual contribution rate of 17.72% versus the 16.00% contribution rate for plan year 2018 as required by statute. The effects on the System’s actuarial soundness due to the decreasing statutory required contribution rate schedule will be presented in future annual actuarial valuation reports as they occur.

Summary and Comparison of Principal Valuation Results

Annual Required Contribution

	Board of Education	Retirement System	Charter Schools	Total
2018				
Normal cost contribution	$ 15,508,017	$ 44,028	$ 5,486,930	$ 21,038,975
Actuarial accrued liability contribution	19,206,986	54,530	6,795,672	26,057,188
Actuarially determined contribution (ADC)	$ 34,715,003	$ 98,558	$ 12,282,602	$ 47,096,163
Covered payroll	195,904,143	556,184	69,313,332	265,773,659
ADC as % of covered payroll	17.72%	17.72%	17.72%	17.72%
Statutory required contribution rate	16.00%	16.00%	16.00%	16.00%
Statutory annual required contribution (ARC)	$ 31,344,663	$ 88,989	$ 11,090,133	$ 42,523,785
2017				
Normal cost contribution	$ 19,818,916	$ 53,325	$ 6,477,946	$ 26,350,187
Actuarial accrued liability contribution	17,557,407	47,240	5,738,755	$ 23,343,402
Annual required contribution	37,376,323	100,565	12,216,701	$ 49,693,589
Covered payroll	195,723,057	526,616	63,973,393	$ 260,223,066
ARC as % of covered payroll	19.10%	19.10%	19.10%	19.10%

	January 1, 2018	January 1, 2017
System Assets		
Expense and contingency reserve	$ 30,751,247	$ 30,921,897
Market value, excluding expense & contingency reserve	883,331,012	819,258,525
Actuarial value	899,816,911	901,076,683
System liabilities		
Unfunded actuarial accrued liability	$ 252,911,307	$ 232,478,771
Projected Unit Credit (PUC) Actuarial Accrued Liability	$1,235,909,034	$1,223,329,683
Entry Age Normal (EAN) Actuarial Accrued Liability	$1,266,012,715	$1,258,219,995
PUC Funding Ratio		
Actuarial value funding ratio	72.8%	73.7%
Market value funding ratio	71.5%	67.0%
EAN Funding Ratio		
Actuarial value funding ratio	71.1%	71.6%
Market value funding ratio	69.8%	65.1%

Analysis of the Valuation

(1) Investment Experience

Our actuarial calculations were based upon the assumption that the System's assets earn 7.50%. The approximate market value rate of return during 2017 was 15.22%. The approximate actuarial value rate of return was 6.85%.

(2) Demographic Experience

The number of active members increased from 5,101 to 5,138 for the period. The average age and service of active members decreased slightly, and the average annual salary increased by $713 (1.4%). There were small changes in the inactive statistics. The membership statistics are provided in Sections 3.3 through 3.7 of this report.

(3) Salary Increases

The average annual salary increased by 1.4% between January 1, 2017 and January 1, 2018.
Total annual covered payroll increased by 2.1% between January 1, 2017 and January 1, 2018.

(4) Changes in Methods from the Prior Valuation

There have been no changes in methods since the prior valuation.

(5) Changes in Assumptions from the Prior Valuation

There have been no changes in assumptions since the prior valuation.

(6) Changes in Benefit Provisions from the Prior Valuation

Effective August 28, 2017, legislation was passed that changed the normal pension eligibility requirement from Rule of 85 to Rule of 80. The impact of this change was to increase the January 1, 2018 Entry Age Normal Actuarial Accrued Liability by $16.8 million.
There were other changes in this legislation that impact employee and employer contribution rates, along with the benefit multiplier for new hires. These changes do not have an impact on the January 1, 2018 actuarial accrued liability since they are prospective in nature. Details of the legislative changes can be found in Section 3.2.

(7) Other Changes

There have been no other changes since the prior valuation.

(8) Summary

The overall effect of experience during the period, along with the changes in assumptions, resulted in a decrease in the PUC funding ratio utilizing the actuarial value of assets from 73.7% to 72.8%. The total actuarially determined contribution rate decreased from 19.10% to 17.72% of covered payroll.

Section 1 - Valuation Results

This section sets forth the results of the actuarial valuation.

Section 1.1	Develops the actuarial accrued liability contribution
Section 1.2	Develops the normal cost contribution
Section 1.3	Develops the required annual contribution
Section 1.4	Actuarial balance sheet as of January 1, 2018
Section 1.5	Projected Unit Credit funding ratios
Section 1.6	Projected Unit Credit funded status
Section 1.7	Prioritized solvency test

Section 1 (continued)

1.1 Determination of the Unfunded Frozen Actuarial Accrued Liability

1.	Unfunded frozen actuarial accrued liability as of January 1, 2017	$ 232,478,771
2.	Normal cost due January 1, 2017	25,397,771
3.	Interest on (1) and (2) at 7.50% to December 31, 2017	19,340,741
4.	Employer contributions in 2017	41,077,344
5.	Interest on (4) at 7.50% to December 31, 2017	0
6.	Supplement for changes in actuarial assumptions or benefits	16,771,368
7.	Unfunded frozen actuarial accrued liability as of January 1, 2018, (1) + (2) + (3) – (4) – (5) + (6)	252,911,307
8.	Actuarial accrued liability contribution for 2018 End of year amortization payment of (7) over 18 years	26,057,188

Section 1 (continued)

1.2 Determination of Normal Cost Contribution

1.	Actuarial present value of future benefits		
	a. Active participants		
	i. Retirement benefits	$ 401,152,551	
	ii. Vested withdrawal benefits	51,489,121	
	iii. Refund of contributions	8,055,910	
	iv. Survivor benefits	4,509,859	
	v. Disability benefits	10,984,219	
	Total		$ 476,191,660
	b. Retired participants and beneficiaries		901,926,852
	c. Inactive participants		
	i. Vested participants	25,299,400	
	ii. Nonvested participants	7,779,159	
	Total		33,078,559
	d. Total actuarial present value of future benefits		1,411,197,071
2.	Unfunded frozen actuarial accrued liability as of January 1, 2018		252,911,307
3.	Actuarial value of assets as of January 1, 2018		899,816,911
4.	Actuarial present value of future participant contributions		127,776,813
5.	Actuarial present value of future employer normal costs, (1)(d) – (2) – (3) – (4), not less than $0		130,692,040
6.	Actuarial present value of future covered payroll of current participants		1,712,311,502
7.	Employer normal cost rate, (5) / (6)		7.63%
8.	Total covered payroll		265,773,659
9.	Normal cost for 2018, (7) x (8)		20,278,530
10.	Normal cost contribution due by December 31, 2018, (9) x [1 + (0.075 x 0.5)]		21,038,975

Section 1 (continued)

1.3 Required Annual Contribution

Actuarially Determined Contribution (ADC):

	Board of Education	Retirement System	Charter Schools	Total
Normal cost contribution	$ 15,508,017	$ 44,028	$ 5,486,930	$ 21,038,975
Actuarial accrued liability contribution	19,206,986	54,530	6,795,672	$ 26,057,188
Actuarially determined contribution (ADC)	34,715,003	98,558	12,282,602	$ 47,096,163
Covered payroll	195,904,143	556,184	69,313,332	$ 265,773,659
ADC as % of covered payroll	17.72%	17.72%	17.72%	17.72%

Statutory Annual Required Contribution (ARC):

	Board of Education	Retirement System	Charter Schools	Total
Covered payroll	$ 195,904,143	$ 556,184	$ 69,313,332	$ 265,773,659
ARC as % of covered payroll	16.00%	16.00%	16.00%	16.00%
Statutory annual required contribution (ARC)	31,344,663	88,989	11,090,133	$ 42,523,785

Section 1 (continued)

1.4 Actuarial Balance Sheet as of January 1, 2018

Actuarial assets		
Actuarial value of current assets		$ 899,816,911
Actuarial present value of future participant contributions		127,776,813
Actuarial present value of future employer contributions for:		
Normal costs		130,692,040
Unfunded actuarial accrued liability		252,911,307
Total current and future assets		$ 1,411,197,071
Actuarial liabilities		
Actuarial present value of benefits now payable		$ 901,926,852
Actuarial present value of benefits payable in the future:		
Active participants	$ 476,191,660	
Terminated vested participants	25,299,400	
Terminated non-vested participants	7,779,159	
Total payable in the future		509,270,219
Total liabilities for benefits		$ 1,411,197,071
Surplus / (deficit)		0

1.5 Projected Unit Credit Funding Ratios

The funding objective of the System is to meet long-term benefit promises through contributions that remain approximately level from year to year as a percentage of covered payroll.

Funding ratios provide a measure of how much progress has been made towards achieving this objective. For this purpose, the System's liabilities are determined using the projected unit credit cost method. Under this method, liabilities are determined for each participant using only service already performed, but anticipating the impact of future salary growth on the benefits attributable to current active participants.

Section 1.6 provides a comparison of this liability measure to the value of assets to produce a snapshot measure of the System's funding ratio.

Another way to check the funding progress of the System is through a prioritized solvency test. Section 1.7 illustrates the history of the System's funding progress under this test.

In a prioritized solvency test, the plan's present assets (cash and investments) are sequentially allocated and compared to three priorities of liabilities as follows:

- Liability 1: Active participant contributions, accumulated with interest;
- Liability 2: The liabilities for future benefits to current inactive participants and beneficiaries; and
- Liability 3: The liabilities for future benefits to current active participants for prior service.

Ideally, progress in funding of these liability groups will normally be exhibited with Liability 1 attaining 100% coverage first, then Liability 2, and finally Liability 3. Note that 100% funding of Liability 3 does not mean that the System has completed its funding of benefits since additional benefits typically are expected to be earned in the future.

Section 1 (continued)

1.6 Projected Unit Credit Funded Status

As of January 1, 2018 the Projected Unit Credit Actuarial Accrued Liability was:

1.	Retired members and beneficiaries currently receiving benefits and terminated members not yet receiving benefits	$ 935,005,411
	a. Current active participants	
	i. Accumulated member contributions, including interest	122,241,799
	ii. Employer-financed benefits	178,661,824
	Total Projected Unit Credit Actuarial Accrued Liability	$ 1,235,909,034

As of January 1, 2018 the Projected Unit Credit AAL was funded as follows:

2.	Net assets available for benefits at actuarial value	$ 899,816,911
3.	Unfunded Projected Unit Credit AAL	336,092,123
4.	Actuarial value funding ratio, (2) / (1)	72.8%
5.	Net assets available for benefits at market value	$ 883,331,012
6.	Unfunded Projected Unit Credit AAL	352,578,022
7.	Market value funding ratio, (5) / (1)	71.5%

Section 1 (continued)

1.7 Prioritized Solvency Test

Valuation date January 1	Active participants' accumulated contributions	Retirees, beneficiaries and inactive participants	Active participants (employer-financed)	Valuation assets	Percent covered by valuation assets		
	(1)	(2)	(3)		(1)	(2)	(3)
1999	130,705,014	276,290,128	303,953,494	694,250,672	100%	100%	95%
2000	129,398,364	353,852,977	288,213,016	770,090,498	100%	100%	100%
2001	127,086,325	414,052,293	269,590,438	828,097,298	100%	100%	100%
2002	116,506,785	476,104,516	372,221,726	861,128,076	100%	100%	72%
2003	115,570,837	492,633,382	361,818,972	873,260,102	100%	100%	73%
2004	106,021,476	528,287,121	364,459,284	901,996,455	100%	100%	73%
2005	89,710,662	518,880,414	368,306,240	935,328,638	100%	100%	89%
2006	90,001,111	661,353,685	319,920,373	983,828,243	100%	100%	73%
2007	96,223,413	712,467,372	305,409,824	1,003,428,983	100%	100%	64%
2008	98,112,123	781,006,957	249,244,208	1,014,923,381	100%	100%	54%
2009	104,576,264	801,995,237	187,035,147	963,851,408	100%	100%	31%
2010	110,054,510	805,831,292	195,185,151	950,709,944	100%	100%	18%
2011	103,178,297	842,643,351	169,510,764	944,356,735	100%	100%	0%
2012	116,268,566	850,498,527	189,084,439	925,389,359	100%	95%	0%
2013	120,355,959	849,412,565	190,553,739	914,494,335	100%	93%	0%
2014	114,092,991	896,477,122	164,014,835	922,922,386	100%	90%	0%
2015	116,755,946	892,626,625	156,682,397	926,905,797	100%	91%	0%
2016	120,507,482	887,757,927	157,501,063	915,391,079	100%	90%	0%
2017	122,746,557	933,916,821	166,666,305	901,076,683	100%	83%	0%
2018	122,241,799	935,005,411	178,661,824	899,816,911	100%	83%	0%

Section 2 - Valuation of the System's Assets

This section of the report shows the development of the actuarial value of the assets of the System and provides information regarding the expense and contingency reserve, investment results and the various assets of the System.

The amount of assets used in the actuarial valuation is known as the "actuarial value of assets." The method is discussed in the summary of methods and assumptions, section 3.8. The development of the actuarial value of assets is shown in section 2.1. An important element in the development of the actuarial value of assets is the expense and contingency reserve. The amount of the reserve is determined pursuant to a policy adopted by the Board of Trustees. The history of the reserve is presented in section 2.2.

As shown in section 2.3, the fund had a rate of return of 6.85% on an actuarial value basis, which is 0.65% below the assumed rate of return of 7.50% for plan year 2017. The rate of return on an actuarial value basis is intended to be a more stable rate of return and fluctuate less than rates of return on a market value basis. Thus, the rate of return on an actuarial basis is not always a fair measure of the annual investment performance of the fund. Another indicator of actual performance during the year is the rate of return on a market value basis which was 15.22% for plan year 2017, also presented in section 2.3.

Effective with the Actuarial Valuation Report for Plan Year January 1, 2017 – December 31, 2017, the annual assumed rate of return on Plan assets is 7.50%.

Section 2 (continued)

2.1 Development of the Actuarial Value of Assets

1.	Actuarial value of assets as of January 1, 2017	$ 901,076,683
2.	Participant contributions	12,591,552
3.	Employer contributions	41,077,344
4.	Benefit payments and expenses	114,563,978
5.	Investment increment at 7.50%, 7.50% x {(1) + .5 x [(2) – (4)]}	63,756,785
6.	Expected actuarial value on January 1, 2018, (1) + (2) + (3) – (4) + (5)	903,938,386
7.	Market value of assets on January 1, 2018	914,082,259
8.	Expense and contingency reserve on January 1, 2018, prior to adjustment	30,751,247
9.	Adjustment to the investment contingency reserve	0
10.	Excess of market value over expected actuarial value, (7) – (6) – (8) – (9)	(20,607,374)
11.	Market value adjustment, 20% x (10)	(4,121,475)
12.	Actuarial value of assets as of January 1, 2018, (6) + (11)	899,816,911

Section 2 (continued)

2.2 The Expense and Contingency Reserve

Effective January 1, 1996, the Board of Trustees revised Rule X, which governs the determination of the amount of the expense and contingency reserve. The expense portion of the reserve is the sum of:

1. The estimated annual operating expenses for the ensuing year:
2. An amount equal to the liability for non-insurance supplements;
3. An amount equal to the liability for insurance supplements for those participants participating in the program on January 1; and
4. The estimated amount of insurance supplements to be paid for participants expected to retire and participate in the program during the ensuing year.

The investment contingency portion of the reserve is intended to help cover significant shortfalls in the actuarial rate of return. When a shortfall of more than 1% occurs, a portion of the reserve is released equal to one half of the amount of the shortfall up to 2% plus any remaining shortfall. When the rate of return exceeds the assumed rate of return by more than 1%, the reserve is increased subject to a maximum reserve of 5% of the market value of the Retirement Fund. The addition equals one half of the amount of the excess up to 2% plus any remaining excess.

The actuarial return on assets was within 1% of 7.50% during plan year 2017; as such, no adjustment can be made to the actuarial value of assets.

Below is a history of the expense and contingency reserve:

January 1	Expense reserve	Investment contingency reserve	Total expense and contingency reserve
1998	$30,891,555	$24,100,041	$54,991,596
1999	22,142,759	45,972,067	68,114,826
2000	27,992,032	50,003,862	77,995,894
2001	29,837,776	50,003,743	79,841,519
2002	23,527,529	50,003,743	73,531,272
2003	24,952,255	37,759,976	62,712,231
2004	26,028,780	37,759,976	63,788,756
2005	27,170,188	45,115,876	72,286,064
2006	32,534,770	45,115,876	77,650,646
2007	29,864,946	50,732,410	80,597,356
2008	31,987,370	57,234,574	89,221,944
2009	30,555,388	0	30,555,388
2010	29,903,107	0	29,903,107
2011	29,480,465	0	29,480,465
2012	29,564,563	0	29,564,563
2013	29,181,897	0	29,181,897
2014	30,439,781	0	30,439,781
2015	29,868,370	0	29,868,370
2016	29,537,454	0	29,537,454
2017	30,921,897	0	30,921,897
2018	30,751,247	0	30,751,247

Section 2 (continued)

2.3 Investment Performance

There are several different methods of approximating the rates of return on investments of the trust fund. Following is a brief comparison of the actuarial assumed rate of return as compared with rates of return on market and actuarial value bases:

a. Market Value Basis

The rate of return on a market value basis is the ratio of the appreciation (or depreciation) of assets less contributions plus disbursements to the market value at the beginning of the year plus the average of the receipts and disbursements made during the year. This may be approximated as follows:

i.	A = Market value of assets as of January 1, 2017	$ 850,180,422
ii.	B = Market value of assets as of January 1, 2018	914,082,259
iii.	C = Contributions during the period	53,668,896
iv.	D = Disbursements during the period	114,563,978
v.	Rate of return: $\dfrac{B - A + D - C}{A + \frac{1}{2}(C - D)}$	15.22%
vi.	Actuarial assumed rate of return for 2017	7.50%
vii.	Difference between actual and assumed rates of return, (v) – (vi)	7.72%

b. Actuarial Value Basis

The rate of return on an actuarial value basis is approximated using the same method:

i.	A = Actuarial value of assets as of January 1, 2017	$ 901,076,683
ii.	B = Actuarial value of assets as of January 1, 2018	899,816,911
iii.	C = Contributions during the period	53,668,896
iv.	D = Disbursements during the period	114,563,978
v.	Rate of return: $\dfrac{B - A + D - C}{A + \frac{1}{2}(C - D)}$	6.85%
vi.	Actuarial assumed rate of return for 2017	7.50%
vii.	Difference between actual and assumed rates of return, (v) – (vi)	-0.65%

Section 3 - Basis of the Valuation

In this section, the basis of the valuation is presented and described. This information – the provisions of the System and the census of members – is the foundation of the valuation, since these are the present facts upon which benefit payments will depend.

A summary of the System's provisions is provided in Section 3.1, the legislative history of the System is provided in Section 3.2, and member census information is shown in Section 3.3 to Section 3.7.

The valuation is based upon the premise that the System will continue in existence, so that future events must also be considered. These future events are assumed to occur in accordance with the actuarial assumptions and concern such events as the earnings of the fund; the number of members who will retire, die or terminate their services; their ages at such termination and their expected benefits.

The actuarial assumptions and the actuarial cost method, or funding method, which have been adopted to guide the sponsor in funding the System in a reasonable and acceptable manner, are described in Section 3.8.

A guide to actuarial terminology used in this report is included as Section 3.9.

Section 3 (continued)

3.1 Summary of Plan Provisions

Participants

All persons regularly employed by the board of education, charter schools, and employees of the board of trustees are in the System.

Retirement age

Normal

Age 65 or any age if age plus the years of credited service equals or exceeds 80 (Rule of 80).

If the employee terminated prior to August 28, 2017, then Age 65 or any age if age plus the years of credited service equals or exceeds 85 (Rule of 85).

Early

Age 60 with 5 years of service

Service retirement allowance

a. 2.00% (1.25% if terminated prior to July 1, 1999 or 1.75% if hired on or after January 1, 2018) times years of credited service, subject to a maximum of 60%
b. Times average final compensation (AFC)
c. Subject to a maximum of 60% of AFC.
   i. AFC is the highest average compensation for any three consecutive years of the last 10 years of service.
   ii. Compensation is the regular wages plus what the employer pays towards the participant's health and welfare benefits.
   iii. Minimum monthly benefit is $10.00 for each year of credited service, up to 15 years, retirement age 65 and over.
   iv. Unused sick leave is added to a participant's credited service and age.

Early retirement benefit

Service retirement allowance reduced five-ninths of one percent for each month of commencement prior to age 65 or the age at which the Rule of 80 (Rule of 85 if terminated prior to August 28, 2017) would have been satisfied had the employee continued working until that age, if earlier.

Disability benefit

Service retirement allowance using actual service, or 25% of AFC if larger, provided that in no case will the benefit exceed that payable if service had continued to age 65.

   a. Disability must be incurred while an employee as determined by the medical board and approved by the board of trustees.
   b. The participant must have a minimum of five years of credited service and not be eligible for normal retirement.

Continued disability is subject to routine verification.

Withdrawal benefit

Accumulated contributions of participant with interest credited to the participant's account.

Section 3 (continued)

3.1 Summary of Plan Provisions

Vested benefit

Full vesting on termination of employment after at least five years of service is provided if contributions are left with the System. The full accrued benefit is payable at age 65 or a reduced early retirement benefit prior to age 65.

Retirement options

In lieu of the benefit paid only over the lifetime of the participant, a reduced benefit payable for life of participant with:

Option 1	Same retirement allowance continued after death to the beneficiary.
Option 2	One-half of the retirement allowance continued after death to the beneficiary.
Option 3	Same retirement allowance continued after death to the beneficiary. If the beneficiary predeceases the participant, the retirement allowance is adjusted back to the unreduced allowance.
Option 4	One-half of retirement allowance continued after death to the beneficiary. If the beneficiary predeceases the participant, the retirement allowance is adjusted back to the unreduced allowance.
Option 5	Increased retirement allowance is provided up to age 62, such that benefit provided prior to age 62 is approximately equal to the sum of the reduced retirement allowance paid after age 62 and Social Security.
Option 6	Options 1 and 5 combined.
Option 7	Options 2 and 5 combined.

Survivor benefits

If an active participant dies after completing 18 months of service, leaving a surviving spouse or other dependent beneficiaries, survivor benefits are payable. The widow or dependent beneficiary may elect to receive either a refund of accumulated contributions, or:

a. A survivor who is the widow at least age 62 and married to a participant for at least one year receives $60 per month.

b. A widow with dependent, unmarried children under age 22 receives $60 per month plus $60 per dependent child, not to exceed $180 per month. The benefit ceases when youngest child is age 22 and resumes again under (a) at age 62.

c. If no benefits are payable under (a) or (b), minor children may receive a benefit of $60 per child or $180 divided among them if more than three children.

d. If no benefits are payable under (a), (b) or (c), a dependent parent or parents may receive or share $60 per month upon attaining age 62.

If an active participant dies after completing 5 years of service, the widow or dependent beneficiary may elect to receive either a refund of accumulated contributions or:

a. If the survivor is the widow, a survivor benefit calculated as if the participant had been age 60 at death and elected Option 1, plus $60 per dependent child not to exceed $180 per month.

b. If there is no widow, a survivor benefit calculated as if the participant had been age 60 at death and elected Option 1.

Section 3 (continued)

3.1 Summary of Plan Provisions

Return of contributions upon death

If after the death of a participant, no further monthly are payable to a beneficiary under an optional form of payment, or under the survivor benefit provisions, the participant's beneficiary shall be paid the excess, if any, of the participant's accumulated contributions over all payments made to or on behalf of the deceased participant.

DROP

Effective July 1, 2001, active participants may elect to enter the deferred retirement option plan (DROP) for up to four years. Upon entering the DROP, the participant's retirement benefit is frozen and credited to the participant's DROP account. At the end of the DROP, or upon earlier termination of employment, the DROP account is paid in a lump sum or installments, at the participant's option. During the DROP, the participant continues as an active participant, but does not pay contributions. To enter the DROP the participant must be age 65 or meet the Rule of 85. The DROP program is no longer available, ending June 30, 2008.

Contributions by participants

Participants hired before January 1, 2018 contribute 5.50% of compensation in 2018. This rate increases 0.50% per year until it reaches 9.00%. After this, the contribution rate will remain at 9.00% of compensation.

Participants hired on or after January 1, 2018 contribute 9.00% of compensation.

Accumulated contributions are credited at the rate of interest established by the board of trustees. The current crediting rate is 5% per year.

Contributions by employers

The employer contribution rate will be set at a flat 16.00% of covered payroll for Plan year 2018. This contribution rate shall be decreased by 0.50% in each subsequent Plan year until reaching 9.00% of covered payroll. After this, the employer contribution rate will remain at 9.00% of covered payroll.

Expenses

Administrative expenses are paid out of investment income.

Section 3 (continued)

3.2 Legislative History of the Retirement System

On and after January 1, 1944, all persons employed by the board of education on a full-time permanent basis are participants of the System as a condition of employment. In 1961, provisions regarding benefits and employee contribution levels were revised for all future employees of the board of education. Participants of the System at that time were granted the right to remain under the "old plan" and have their membership governed by the provisions of the law in effect prior to 1961. These old plan participants have both benefits and contributions based on a $3,000 maximum annual compensation. Old plan participants have been given the option to transfer into the revised plan at various times since 1961.

Effective October 13, 1969, legislation permitted the reinstatement of credited service lost during the years 1944 to 1947 inclusive when the married women teachers rule was in effect.

Effective August 31, 1972, legislation resulted in the following changes:

- Purchase of past service credit by paying contributions for service claimed plus interest.
- Service as extended substitute teacher.
- Service of re-employed participants lost on prior terminations.
- Service out-state Missouri and outside the state of Missouri.
- Service lost by those who elected to stay out of the retirement plan either temporarily or to date.
- Old plan participants who wished to become new plan participants could do so by paying the differential in participant contributions under the new and old plans, plus interest.
- Dependent beneficiary on death of participant before retirement but after age 60 or age 55 with 30 years service may receive option 1 benefit as if participant had retired under such option.
- A participant with five or more years of service and prior to age 65 may be retired with a disability benefit if the medical board certifies that such participant is mentally or physically totally incapacitated for further performance of duty.
- Minimum retirement benefit at age 65 or after 10 years service is $50.00 per month.

On February 10, 1975, the Missouri Supreme Court handed down a decision supporting HB 613 (Section 169.585 of state statutes), which granted increased benefits to retired teachers. The increases apply to those teachers who retired after June 30, 1957, and prior to January 1, 1971. Technically, those retirees are retained as "advisors and supervisor" and receive a "salary" of $5 per month for each year of service, with a maximum of $75. This salary plus the regular retirement benefit cannot exceed $150 per month. To the extent that assets are depleted because of this law, future district contributions will increase. Because these benefits are paid as "salaries," coming out of investment income along with other expenses of operation, there will be less money available for crediting of interest to the various funds at the end of the year.

Section 3 (continued)

3.2 Legislative History of the Retirement System

Effective August 13, 1978 legislation resulted in the following changes:

- The service retirement allowance and projected service retirement allowance was changed to 1-1/4% of average final compensation per year of credited service. The participant's allowance plus his Social Security primary insurance amount could not exceed 80% of his average final compensation. Participants born before 1917 receive the larger of the allowances calculated under the new formula and the formula in effect immediately before it.
- Credited service no longer limited to a maximum of 35 years.
- Two new joint and survivor optional forms of payment were added which provide for the participant's pension to be adjusted back to his unreduced pension in the event his spouse predeceases him.
- Contributions from participants shall be 3% of compensation.
- End of period for purchasing prior service or outside service extended from December 31, 1973 to December 31, 1980. Deleted requirement of electing to purchase out-state or outside the state of Missouri service within one year of completing five years of credited service.
- Gives board of trustees the power to establish regulations, methods and factors that may be needed to calculate primary Social Security benefits.
- Dependent beneficiary on death of participant before retirement with five or more years of credited service may receive option 1 benefit as if the participant had retired under that option as of the date of his death.
- Allow retired educational secretaries to serve as part-time or temporary substitute educational secretary up to a maximum of 360 hours per school year without a reduction in the retired employee's retirement allowance or requiring the retired employees to contribute to the retirement system.

Effective September 28, 1979, legislation resulted in the following changes:

- Accumulated and unused days of sick leave shall be included in computing a participant's age and credited service at retirement.
- Participants who have attained age 62 and who have 30 or more years of credited service may retire and receive a service retirement allowance without reduction for early retirement. The early retirement reduction for participants who retire with 30 or more years of credited service but who have not attained age 62 on their retirement date shall be determined on the basis of the number of months by which their age at retirement is less than age 62.
- Benefits to survivors of a participant who dies while an employee and after having at least 18 months of credited service are as follows:
  - (a) Surviving spouse age 62 or over: $60 per month.
  - (b) Surviving spouse with unmarried dependent children under age 22: $60 per month, plus $30 per month for each eligible child, with a maximum of $150 per month.
  - (c) Unmarried dependent children under age 22: $60 per month for each eligible child, with a maximum of $120 per month. This benefit is payable if the benefit in (b) is not payable.
  - (d) Dependent parent(s): $60 per month, provided no benefits are payable under (a), (b) or (c) above.

Section 3 (continued)

3.2 Legislative History of the Retirement System

Effective September 28, 1981, legislation resulted in the following changes:

- The provision limiting service retirement and projected service retirement allowances to 80% of average final compensation less Social Security was removed for future retirees.
- The minimum monthly benefit payable to participants retiring on or after age 65 with 10 or more years of service was increased to $75.
- Old plan participants were extended the option to transfer into the current System by paying the difference in participant contributions plus interest. Such election to be made on or before December 31, 1984. Retired participants who retired prior to January 1, 1955, may be consultants" at a "salary" equal to $4 for each year of retirement prior to January 1, 1982. Total "salaries" as a "school consultant" and "special school advisor and supervisor" are limited to $250 per month.
- The retirement system may contribute as part of its administrative expenses toward health, life and similar insurance for retirees.
- The actuarial cost method was changed from the "entry age cost method" to the "frozen entry age cost method." The period for amortizing "supplements" to the unfunded actuarial accrued liability was set at 50 years from the time the "supplement" is created.
- Several changes were made dealing with the administration and operation of the System.
- Investment powers were broadened.

Effective September 28, 1984, legislation resulted in the following changes:

- Dependent beneficiary on death of employed, active participant before retirement with five or more years of service may receive option 1 benefit as if the participant had attained age 55 (if less than 55 at his death) and had retired under option 1 as of the date of his death.
- In addition to the option 1 death benefit, a surviving spouse may receive $30 per month for each unmarried dependent child, provided that the total benefit does not exceed the greater of $150 or the option 1 benefit.
- Surviving spouse benefits do not cease on remarriage.
- Dependent children's benefits do not require that the child remain a full-time student.
- Participants retired on disability may elect to receive an actuarial equivalent benefit under options 1 through 4.
- Retired participants who retired on or after January 1, 1976, may be employed as school consultants and receive a salary and insurance benefits provided other retirants.

Section 3 (continued)

3.2 Legislative History of the Retirement System

Effective August 13, 1986, legislation resulted in the following changes:

- A participant with 30 years of credited service who is between the ages of 55 and 62, upon certification by the board of education, is eligible for a supplemental early retirement benefit payable to age 62. This provision remains in effect until December 31, 1991.
- Benefits to a surviving spouse for dependent children are increased from $30 to $60 per month, with a maximum of $240 per month, including the $60 for the surviving spouse.
- Supplemental pay to retired participants employed as "school consultants" is increased by $2 per month for each year between the participant's date of retirement and December 31, 1986

Effective June 19, 1987, legislation resulted in the following changes:

- Reinstated the option for "old plan" participants to elect "new plan" membership by paying the difference in contributions accumulated with interest.
- Increased the minimum benefit for participants retiring on or after age 65 to $10 per month for each year of credited service, up to a maximum of 15 years.
- Several changes were made dealing with the accounting, administration, and operation of the System.

Effective August 13, 1988, legislation resulted in the following changes:

- Made provisions for children's benefits uniform, providing $60 per month per child, up to a maximum of $180 per month, under both subsections 169.460(13) and (15) survivor benefits.
- Supplemental pay to retired participants of $2 per month for each year of retirement up to December 31, 1988.

Effective June 14, 1989, legislation resulted in the following changes:

- The maximum on compensation was removed.
- Average final compensation is based on the highest three consecutive years, rather than the highest five consecutive years.
- Participants may retire with unreduced benefits at any age, if their age plus credited service equals or exceeds 85 (the "Rule of 85").

Effective May 31, 1990, legislation resulted in the following change:

- Supplemental pay of $2 per month for each year of retirement up to December 31, 1990.

Effective August 28, 1993, legislation resulted in the following change:

- Supplemental pay of $3 per month for each year of retirement up to December 31, 1993.

Section 3 (continued)

3.2 Legislative History of the Retirement System

Effective August 28, 1996, legislation resulted in the following changes:

- Provision was added for the purchase of service for certain periods of layoff.
- The investment trustee position was eliminated and the position of school administrator trustee was added.
- Cost-of-living increases for participants who retired prior to August 28, 1996, with at least 15 years of credited service. The cost-of-living increases are up to 3% in one year, with a cumulative maximum of 10%.
- The board of education is authorized to increase retirement benefits and the participant contribution rate, subject to several conditions.

Effective August 28, 1997, legislation resulted in the following change:

- Cost-of-living increases extended to participants who retired prior to August 28, 1997, with at least 15 years of credited service. The cost-of-living increases are up to 3% in one year, with a cumulative maximum of 10%.

In accordance with the statutory authority granted the board of education in 1996, the board of education made the following changes:

- Participant contributions were increased to 4.5%, effective July 1, 1998; to 5.0%, effective July 1, 1999; and, if necessary to 5.5%, effective July 1, 2000.
- The service retirement allowance was changed to 2.00% of average final compensation per year of credited service, subject to a maximum of 60% of average final compensation, effective for participants who retired after June 29, 1999.
- A "catch-up" cost-of-living adjustment (COLA) is provided for participants who retired prior to June 30, 1999, and survivors of participants who retired or died prior to June 30, 1999. The amount of the "catch-up" COLA is equal to 65% of the amount by which the participant's original benefit would have increased due to increases in the CPI, in excess of any supplements or COLA increases being received by the participant. The "catch-up" COLA is effective July 1, 2000.
- The board of education agreed to contribute 8.03% of covered payroll for 1998, 1999, and 2000, in order to fund the benefit increase and the "catch-up" COLA.

In accordance with the statutory authority granted the board of education in 1996, the board of education made the following changes:

- Effective January 1, 2001, all participants who retired prior to January 1, 2000, received a 3% cost-of-living increase.
- Effective July 1, 2001, a DROP was made available until June 30, 2005, at which time the program will be evaluated to determine whether or not it should be extended. Eligible participants may elect to enter the DROP for up to four years.
- In conjunction with the DROP, employers will contribute at 8.00% of covered payroll for 2001. The contribution rate for subsequent years will be based on the rate determined by the actuarial valuation for the January 1 of the year preceding the year the contribution is due.

Section 3 (continued)

3.2 Legislative History of the Retirement System

Effective August 28, 2002, legislation resulted in the following changes:

- Purchase of service rules were updated.
- The System may accept qualified transfers of funds for the purchase of service.
- Clarified provisions relating to charter school participation in the System.
- Option 5, the level income option is added.
- Replaced the specific actuarial cost method in the statutes with a provision that the method adopted by the board of trustees may be any method in accordance with generally accepted actuarial standards. The amortization period for the UAAL may not exceed 30 years.

Effective August 28, 2017, legislation resulted in the following changes:

- Replaced the normal pension eligibility requirement where a member's age plus credited service equals not less than eighty-five (the "Rule of 85") with not less than eighty (the "Rule of 80").
- For members hired for the first time on or after January 1, 2018, the multiplier in the annual pension benefit formula (credited service x pension multiplier x average final compensation) was reduced from two percent (2%) to one and three-fourths percent (1.75%).
- Beginning January 1, 2018, the employee contribution rate of five percent (5%) of compensation shall increase by one-half of one percent (0.5%) annually until such time as the percentage equals nine percent (9%).
- For member's hired for the first time on or after January 1, 2018, the employee contribution rate shall be nine percent (9%) of compensation.
- For calendar year 2018, the actuarially determined annual employer contribution rate shall be replaced with sixteen percent (16%) of total employee compensation for each employer which, for each calendar year thereafter, shall decrease by one-half of one percent (0.5%) until calendar year 2032, when the annual employer contribution rate shall equal nine percent (9%) of total employee compensation for each employer for that year and all subsequent years.

3.3 Changes in System Participation

	Active	Retirees	Beneficiaries	Disabled	Total In Pay Status	Deferred Vested	Nonvested with Balance	Total Terminated Records	Total
Total as of January 1, 2017	**5,101**	4,007	303	251	**4,561**	522	2,032	**2,554**	12,216
New Entrants	**831**						65	**65**	896
Rehires/Transfers	**47**	(1)			**(1)**	(7)	(39)	**(46)**	0
Retirements	**(115)**	135	(1)		**134**	(19)		**(19)**	0
Disablements	**(7)**			9	**9**	(2)		**(2)**	0
Beneficiaries		(1)	16		**15**				15
Deaths	**(17)**	(162)	(19)	(11)	**(192)**	(9)	(20)	**(29)**	(238)
Deferred Vested	**(106)**					111	(3)	**108**	2
Nonvested Terminations - Account Balance	**(264)**					(38)	321	**283**	19
Refunds Paid in 2017	**(352)**					(17)	(113)	**(130)**	(482)
Data Adjustments	**20**					8	(1)	**7**	27
Total as of January 1, 2018	**5,138**	3,978	299	249	**4,526**	549	2,242	**2,791**	12,455

Section 3 (continued)

3.4 Member Census Information

As of January 1	2017	2018
Active Members		
Number	5,101	5,138
Average Age	43.68	43.53
Average Service	7.82	7.64
Average Annual Base Pay	$ 51,014	$ 51,727
Vested Terminated Members		
Number	522	549
Average Account Balance	$ 29,781	$ 30,722
Non-vested Terminated Members		
Number	2,032	2,242
Average Account Balance	$ 3,585	$ 3,470
Benefit Recipients		
Number	4,561	4,526
Average Age	74.03	74.29
Average Monthly Benefit	$ 1,926	$ 1,951

Section 3 (continued)

3.5 Distributions of Active Members

Years of Service By Age
Charter Schools

	Years of Service									
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
Under 25	109	0	0	0	0	0	0	0	0	109
25 - 29	294	24	0	0	0	0	0	0	0	318
30 - 34	189	67	4	0	0	0	0	0	0	260
35 - 39	146	49	20	1	0	0	0	0	0	216
40 - 44	92	29	11	13	0	0	0	0	0	145
45 - 49	78	30	9	3	0	0	0	0	0	120
50 - 54	52	24	5	2	2	1	0	0	0	86
55 - 59	42	22	6	2	1	1	0	0	0	74
60 - 64	31	16	6	1	0	0	0	0	0	54
65 - 69	9	4	0	0	0	0	0	0	0	13
70 & Up	1	2	0	0	0	0	0	0	0	3
Total	1043	267	61	22	3	2	0	0	0	1,398

Years of Service By Age
School District

	Years of Service									
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
Under 25	147	0	0	0	0	0	0	0	0	147
25 - 29	385	32	0	0	0	0	0	0	0	417
30 - 34	264	107	19	0	0	0	0	0	0	390
35 - 39	219	95	74	17	0	0	0	0	0	405
40 - 44	164	77	70	96	14	0	0	0	0	421
45 - 49	145	93	62	91	53	4	0	0	0	448
50 - 54	144	64	59	81	40	21	3	0	0	412
55 - 59	119	83	50	79	62	56	32	3	0	484
60 - 64	91	79	49	74	49	30	32	19	6	429
65 - 69	23	31	16	23	14	8	12	7	9	143
70 & Up	7	5	5	10	3	2	3	1	1	37
Total	1,708	666	404	471	235	121	97	30	16	3,733

Section 3 (continued)

3.5 Distributions of Active Members

Years of Service By Age
Total

	Years of Service									
Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	Total
Under 25	256	0	0	0	0	0	0	0	0	256
25 - 29	679	56	0	0	0	0	0	0	0	735
30 - 34	454	174	23	0	0	0	0	0	0	651
35 - 39	365	144	94	18	0	0	0	0	0	621
40 - 44	256	106	81	109	14	0	0	0	0	566
45 - 49	223	123	71	94	53	4	0	0	0	568
50 - 54	196	88	65	83	42	22	3	0	0	499
55 - 59	162	105	58	81	63	57	32	3	0	561
60 - 64	123	95	56	75	49	30	32	19	6	485
65 - 69	32	35	16	23	14	8	12	7	9	156
70 & Up	8	7	5	10	3	2	3	1	1	40
Total	2,754	933	469	493	238	123	82	30	16	5,138

Section 3 (continued)

3.6 Distributions of Inactive Members

Deferred Vested and Nonvested

Account Balance	Vested	Non-Vested	Total
0-1,000	13	691	704
1,000-5,000	16	981	997
5,000-10,000	29	417	446
10,000-25,000	208	144	352
25,000-50,000	193	8	201
50,000-75,000	69	1	70
75,000-100,000	16	0	16
100,000+	5	0	5
Total	549	2,242	2,791

Retirees, Beneficiaries and Disabled

Option	Service benefit	Disability benefit	Survivor benefit	All
0	3,371	201	299	3,595
1	131	13	0	279
2	81	5	0	122
3	180	17	0	261
4	178	6	0	221
5	22	2	0	24
6	12	5	0	20
7	3	0	0	4
Total	3,978	249	299	4,526

Annual Benefit

Option	Service benefit	Disability benefit	Survivor benefit	All
0	$ 85,240,366	$ 2,946,838	$ 3,501,028	$ 91,688,232
1	2,442,222	174,128	0	2,616,350
2	1,862,023	117,333	0	1,979,355
3	3,740,787	238,317	0	3,979,104
4	4,659,108	131,227	0	4,790,335
5	550,115	14,873	0	564,987
6	237,524	48,317	0	285,841
7	72,357	0	0	72,357
Total	$ 98,804,502	$ 3,671,033	$ 3,501,028	$105,976,561

Section 3 (continued)

3.7 Schedule of Retirees and Beneficiaries Added/Removed From Rolls

	Added to Payroll		Removed from Payroll		Payroll Year-End		% Increase in Annual Allowances	Average Annual Allowance
Plan Year	No.	Annual Allowances	No.	Annual Allowances	No.	Annual Allowances		
2009	N/A		N/A		N/A		N/A	N/A
2010	N/A		N/A		4,370		N/A	N/A
2011	373		156		4,587	$ 98,927,501	N/A	$ 21,567
2012	135	$ 2,606,505	182	$ 2,793,752	4,540	$ 98,768,933	-0.16%	$ 21,755
2013	164	$ 3,544,756	188	$ 2,699,920	4,516	$ 99,629,314	0.87%	$ 22,061
2014	313	$ 7,711,256	140	$ 2,288,004	4,689	$ 105,061,832	5.45%	$ 22,406
2015	163	$ 3,774,578	228	$ 3,783,237	4,624	$ 105,066,268	0.00%	$ 22,722
2016	151	$ 3,279,162	188	$ 3,058,449	4,587	$ 105,295,884	0.22%	$ 22,955
2017	145	$ 3,114,108	171	$ 2,978,925	4,561	$ 105,434,220	0.13%	$ 23,116
2018	158	$ 4,044,180	193	$ 3,526,969	4,526	$ 105,976,561	0.51%	$ 23,415

Section 3 (continued)

3.8 Summary of Methods and Assumptions

Interest

7.5% per annum, which includes a 2.75% allowance for inflation.

Participant account interest crediting rate

5.0% per annum.

Expenses

The rate of interest assumed is net of expenses.

Mortality – Healthy Lives

Mortality tables issued by the SOA, the RP-2014 Combined Healthy Mortality Table (rolled back to 2006), projected fully generationally using projection scale MP-2015. The mortality assumption for Inactive participants receiving benefits is increased by 10% to account for the higher mortality experienced by the Plan. Rates are shown for pre-commencement in Table 1 and post-commencement in Table 2.

Disability Mortality

RP-2014 Disabled Mortality Table (rolled back to 2006) for disabled retired Members, projected fully generationally using projection scale MP-2015. Rates are shown in Table 6.

Withdrawal

Withdrawals are assumed to occur at rates based on actual experience of the retirement system. During the first five years of membership, withdrawals are assumed to occur at the following rates:

Year of Membership	Non-charter school employees	Charter school employees
1st	25.0%	35.0%
2nd	20.0%	35.0%
3rd	20.0%	35.0%
4th	20.0%	25.0%
5th	15.0%	15.0%

The rates used after the first five years of membership are shown in Table 3.

Salary scale

Salaries are assumed to increase at the rate of 5.0% per year for the first 5 years of employment and 3.50% thereafter.

Disability

Disabilities are assumed to occur at rates based on the actual experience of the retirement system. The rates used are shown in Table 5.

Section 3 (continued)

3.8 Summary of Methods and Assumptions

Retirement

Retirements occur at rates based on the actual experience of the retirement system. The age-related rates used are shown in Table 4. The rates are different for those eligible to retire under the Rule of 80 and those not eligible to retire under the Rule of 80.

Family Structure

The probability of a participant being married and the probable number of children are based on a table constructed by the Social Security Administration, modified to reflect the experience of the retirement system. The rates used are shown in Table 7. For married participants, husbands are assumed to be 3 years older than their wives.

Usage of Cash-out Option

Participants terminating in vested status are given the option of taking a refund of their accumulated participant contributions instead of a deferred retirement benefit. Active members who terminate in the future with a vested benefit are assumed to take a deferred vested annuity, unless a refund of contributions and interest is greater than the actuarial present value of their vested deferred benefit.

Future Benefit Increases or Additional Benefits

When funding is adequate, the Board may authorize cost of living adjustments (COLAs), as noted in the summary of plan provisions. This valuation assumes that no future COLAs will be awarded.

Actuarial Method – Frozen Entry Age

The actuarial cost method used by the System is the "frozen entry age actuarial cost method." Under this method, on the initial actuarial valuation date for which the cost method is used, the annual cost accruals (individual normal costs for each participant) are determined as a level percentage of pay for each year from entry age until retirement or termination. The initial Unfunded Frozen Actuarial Accrued Liability (UFAAL) was originally determined as of January 1, 1981. Entry age is determined at the date each participant would have entered the System. The sum of these individual normal costs for all active participants whose attained ages are under the assumed retirement age is the normal cost for the initial plan year. The excess of all normal costs falling due prior to the initial actuarial valuation date, accumulated with interest, over the plan assets establishes the UFAAL.

The UFAAL is only frozen in that it is not adjusted due to experience gains and losses. Instead, gains and losses are reflected through changes in the normal cost accrual rate. The UFAAL does change, increasing due to interest and additional normal costs, and decreasing due to contributions. Any changes to plan provisions or actuarial assumptions results in a change to the UFAAL. The amount of the change is determined by computing the impact in the actuarial accrued liability as of the valuation date coincident with or next following the change.

Section 3 (continued)

3.8 Summary of Methods and Assumptions

Normal costs are calculated as the level percentage of pay required to fund the excess of the actuarial present value of future benefits over the sum of the actuarial value of current assets and the remaining UFAAL.

Effective January 1, 2006, UFAAL was reestablished to better reflect an appropriate relationship between the normal cost and the actuarial accrued liability.

The funding requirement for each plan year is the sum of the "normal cost contribution" (equal to the normal cost for that year), plus the "actuarial accrued liability contribution." The "actuarial accrued liability contribution" is the payment required to amortize the UFAAL over 30 years, from January 1, 2006, the date that it was reestablished.

Valuation of Assets

The actuarial value of assets is determined using the assumed yield method of valuing assets. Under the assumed yield asset valuation method, the prior year's actuarial value is increased at the assumed rate of return with appropriate adjustments for contributions and disbursements to produce an expected actuarial value of assets at the end of the year. The expected actuarial value is compared to the market value of assets less the expense and contingency reserve, and 20% of the difference is added to the expected actuarial value. The actuarial value of assets was "fresh-started" as of January 1, 2006 and set equal to the market value of assets as of that date.

Changes in Methods and Assumptions from the Prior Valuation

There were no method or assumption changes made since the prior valuation.

Effective August 28, 2017, legislation passed by the Missouri General Assembly and signed into law by then Governor Eric Greitens changed several of the System's Plan Provisions. A detailed description of these changes appears at the end of Section 3.2.

3.8 Summary of Methods and Assumptions

Table 1
Mortality Rates for Pre-Commencement
Annual Rates Per 1,000 Members

	Rate			Rate	
Age	Male	Female	Age	Male	Female
20	0.190	0.116	60	2.959	3.365
21	0.203	0.113	61	3.369	3.668
22	0.215	0.114	62	3.704	3.986
23	0.233	0.119	63	4.180	4.314
24	0.251	0.126	64	4.540	4.648
25	0.275	0.134	65	4.892	4.983
26	0.314	0.147	66	5.398	5.314
27	0.327	0.153	67	5.731	5.636
28	0.336	0.162	68	5.858	5.945
29	0.353	0.171	69	6.143	6.240
30	0.380	0.193	70	6.210	6.517
31	0.427	0.239	71	7.026	7.108
32	0.481	0.273	72	8.658	8.290
33	0.540	0.298	73	11.106	10.064
34	0.601	0.319	74	14.369	12.429
35	0.662	0.337	75	18.448	15.385
36	0.720	0.354	76	23.343	18.932
37	0.774	0.369	77	29.054	23.071
38	0.800	0.386	78	35.581	27.801
39	0.821	0.406	79	42.924	33.122
40	0.841	0.442	80	51.083	39.034
41	0.863	0.484	81	58.516	43.204
42	0.890	0.533	82	66.910	47.896
43	0.922	0.586	83	74.584	53.181
44	0.961	0.644	84	84.893	59.146
45	1.005	0.682	85	94.233	67.435
46	1.044	0.719	86	104.477	76.970
47	1.085	0.755	87	118.458	87.853
48	1.128	0.817	88	134.192	97.854
49	1.172	0.883	89	148.298	111.198
50	1.217	0.985	90	167.257	122.890
51	1.262	1.100	91	182.177	134.949
52	1.309	1.271	92	202.142	147.094
53	1.401	1.468	93	218.060	162.763
54	1.503	1.700	94	233.954	174.573
55	1.671	1.969	95	255.453	185.756
56	1.883	2.287	96	271.129	196.137
57	2.132	2.577	97	286.358	210.344
58	2.424	2.817	98	308.123	218.852
59	2.677	3.081	99	322.695	226.123

3.8 Summary of Methods and Assumptions

Table 2
Mortality Rates for Post-Commencement
Annual Rates Per 1,000 Members

	Rate			Rate	
Age	Male	Female	Age	Male	Female
20	0.190	0.116	60	5.656	5.525
21	0.203	0.113	61	6.358	6.166
22	0.215	0.114	62	7.004	6.852
23	0.233	0.119	63	7.918	7.582
24	0.251	0.126	64	8.761	8.372
25	0.275	0.134	65	9.703	9.235
26	0.314	0.147	66	11.004	10.170
27	0.327	0.153	67	12.182	11.175
28	0.336	0.162	68	13.160	12.271
29	0.353	0.171	69	14.537	13.503
30	0.380	0.193	70	15.686	14.919
31	0.427	0.239	71	17.356	16.177
32	0.481	0.273	72	19.271	17.994
33	0.540	0.298	73	21.465	19.543
34	0.601	0.319	74	23.946	21.660
35	0.662	0.337	75	27.356	23.365
36	0.720	0.354	76	30.490	25.743
37	0.774	0.369	77	34.715	29.017
38	0.800	0.386	78	39.486	31.986
39	0.821	0.406	79	44.915	35.314
40	0.841	0.442	80	51.083	39.034
41	0.890	0.484	81	58.516	43.204
42	0.987	0.533	82	66.910	47.896
43	1.133	0.586	83	74.584	53.181
44	1.328	0.644	84	84.893	59.146
45	1.572	0.689	85	94.233	67.435
46	1.864	0.778	86	104.477	76.970
47	2.205	0.912	87	118.458	87.853
48	2.595	1.090	88	134.192	97.854
49	3.034	1.313	89	148.298	111.198
50	3.521	1.580	90	167.257	122.890
51	3.556	1.697	91	182.177	134.949
52	3.546	1.914	92	202.142	147.094
53	3.595	2.193	93	218.060	162.763
54	3.643	2.532	94	233.954	174.573
55	3.798	2.935	95	255.453	185.756
56	4.033	3.418	96	271.129	196.137
57	4.344	3.908	97	286.358	210.344
58	4.758	4.385	98	308.123	218.852
59	5.165	4.929	99	322.695	226.123

Section 3 (continued)

3.8 Summary of Methods and Assumptions

Table 3
Withdrawal Rates
Annual Rates Per 1,000 Members

Age	Rate	Age	Rate
20	204.0	45	44.0
21	197.0	46	41.0
22	190.0	47	37.0
23	184.0	48	34.0
24	177.0	49	31.0
25	171.0	50	28.0
26	161.0	51	26.0
27	151.0	52	25.0
28	141.0	53	24.0
29	131.0	54	23.0
30	121.0	55	22.0
31	117.0	56	21.0
32	112.0	57	20.0
33	108.0	58	19.0
34	103.0	59	18.0
35	99.0	60	17.0
36	96.0	61	0.0
37	92.0	62	0.0
38	89.0	63	0.0
39	86.0	64	0.0
40	83.0		
41	75.0		
42	67.0		
43	59.0		
44	52.0		

Section 3 (continued)

3.8 Summary of Methods and Assumptions

Table 4
Retirement Rates
Annual Rates Per 1,000 Members

Age	Rule of 80 Rate	Not Rule of 80 Rate
50-51	200.0	N/A
52-59	150.0	N/A
60	200.0	100.0
61	200.0	100.0
62	250.0	150.0
63	250.0	150.0
64	250.0	200.0
65	300.0	350.0
66	300.0	200.0
67	300.0	200.0
68	300.0	200.0
69	300.0	200.0
70 - 71	300.0	300.0
72	1,000.0	1,000.0

3.8 Summary of Methods and Assumptions

Table 5
Disability Rates
Annual Rates Per 1,000 Members

	Rate			Rate	
Age	Males	Females	Age	Males	Females
20	0.00	0.00	45	1.50	1.00
21	0.00	0.00	46	1.60	1.10
22	0.00	0.00	47	1.70	1.20
23	0.00	0.00	48	1.80	1.30
24	0.00	0.00	49	1.90	1.40
25	0.00	0.00	50	2.00	1.50
26	0.00	0.00	51	2.50	1.70
27	0.00	0.00	52	3.00	1.90
28	0.00	0.00	53	3.50	2.10
29	0.00	0.00	54	4.00	2.30
30	0.40	0.40	55	4.50	2.50
31	0.40	0.40	56	4.70	2.60
32	0.40	0.40	57	4.90	2.75
33	0.40	0.40	58	5.10	2.85
34	0.40	0.40	59	5.30	3.00
35	0.40	0.40	60	5.50	3.25
36	0.45	0.45	61	6.00	3.50
37	0.50	0.50	62	6.50	3.50
38	0.60	0.60	63	7.00	3.50
39	0.70	0.70	64	7.50	3.50
40	0.80	0.75	65	0.00	0.00
41	0.95	0.80			
42	1.10	0.85			
43	1.25	0.90			
44	1.40	0.95			

Section 3 (continued)

3.8 Summary of Methods and Assumptions

Table 6
Post-Disability Mortality Rates
Annual Rates Per 1,000 Members

	Rate			Rate	
Age	Male	Female	Age	Male	Female
20	0.000	0.000	60	42.042	21.839
21	22.571	7.450	61	43.474	22.936
22	22.571	7.450	62	44.981	24.080
23	22.571	7.450	63	46.584	25.293
24	22.571	7.450	64	48.307	26.600
25	22.571	7.450	65	50.174	28.026
26	22.571	7.450	66	52.213	29.594
27	22.571	7.450	67	54.450	31.325
28	22.571	7.450	68	56.909	33.234
29	22.571	7.450	69	59.613	35.335
30	22.571	7.450	70	62.583	37.635
31	22.571	7.450	71	65.841	40.140
32	22.571	7.450	72	69.405	42.851
33	22.571	7.450	73	73.292	45.769
34	22.571	7.450	74	77.512	48.895
35	22.571	7.450	75	82.067	52.230
36	22.571	7.450	76	86.951	55.777
37	22.571	7.450	77	92.149	59.545
38	22.571	7.450	78	97.640	63.545
39	22.571	7.450	79	103.392	67.793
40	22.571	7.450	80	109.372	72.312
41	22.571	7.450	81	115.544	77.135
42	22.571	7.450	82	121.877	82.298
43	22.571	7.450	83	128.343	87.838
44	22.571	7.450	84	134.923	93.794
45	22.571	7.450	85	141.603	100.203
46	23.847	8.184	86	148.374	107.099
47	25.124	8.959	87	155.235	114.512
48	26.404	9.775	88	162.186	122.464
49	27.687	10.634	89	169.233	130.972
50	28.975	11.535	90	183.408	140.049
51	30.268	12.477	91	199.769	149.698
52	31.563	13.456	92	216.605	159.924
53	32.859	14.465	93	233.662	170.433
54	34.152	15.497	94	250.693	182.799
55	35.442	16.544	95	267.491	194.509
56	36.732	17.598	96	283.905	205.379
57	38.026	18.654	97	299.852	215.240
58	39.334	19.710	98	315.296	223.941
59	40.668	20.768	99	330.207	231.387

Section 3 (continued)

3.8 Summary of Methods and Assumptions

Table 7
Family Structure

Age		Age of youngest child	Average number of children	Probability of being married	Probability of children if married
Male	Female				
20	17	2	.90	.30	.50
21	18	2	.90	.35	.50
22	19	2	.98	.40	.50
23	20	2	.98	.46	.53
24	21	3	1.05	.53	.56
25	22	3	1.13	.60	.59
26	23	4	1.20	.67	.62
27	24	4	1.28	.74	.65
28	25	4	1.35	.76	.67
29	26	5	1.43	.78	.69
30	27	5	1.50	.80	.71
31	28	6	1.58	.82	.73
32	29	6	1.65	.84	.75
33	30	7	1.80	.85	.76
34	31	7	1.95	.86	.77
35	32	8	2.10	.87	.78
36	33	8	2.10	.87	.79
37	34	9	2.10	.87	.80
38	35	9	2.30	.87	.79
39	36	10	1.95	.87	.78
40	37	10	1.88	.87	.77
41	38	11	1.80	.87	.76
42	39	11	1.73	.87	.75
43	40	11	1.73	.87	.72
44	41	12	1.65	.87	.69
45	42	12	1.65	.86	.66
46	43	12	1.58	.86	.63
47	44	12	1.58	.86	.60
48	45	12	1.50	.85	.56
49	46	12	1.43	.85	.52
50	47	13	1.43	.85	.48
51	48	13	1.35	.85	.44
52	49	13	1.35	.85	.40
53	50	13	1.35	.85	.37
54	51	13	1.35	.84	.34

Section 3 (continued)

3.8 Summary of Methods and Assumptions

Table 7
Family Structure
(continued)

Age		Age of youngest child	Average number of children	Probability of being married	Probability of children if married
Male	Female				
55	52	13	1.28	.84	.31
56	53	13	1.28	.83	.28
57	54	13	1.28	.83	.25
58	55	13	1.28	.83	.23
59	56	13	1.20	.82	.21
60	57	13	1.20	.81	.19
61	58	13	1.20	.80	.17
62	59	13	1.20	.79	.15
63	60	13	1.20	.78	.13
64	61	13	1.20	.77	.11
65	62	13	1.13	.76	.09
66	63	13	1.13	.75	.07
67	64	13	1.13	.74	.05
68	65	13	1.13	.73	.04
69	66	13	1.05	.72	.03
70	67	13	1.05	.71	.02
71	68	13	1.05	.70	.01

Section 3 (continued)

3.9 Definition of Actuarial Terms

Accrued benefit

The benefit earned by a participant as of the date at which the determination is made payable in the form of an annual benefit commencing at normal retirement age. The accrued benefit is payable for the member's lifetime only, however if the total monthly payments at the member's death are less than contributions accumulated with interest, the remaining employee contribution balance will be paid to the member's beneficiary.

Accumulated plan benefits

The accrued benefits and any other benefits, whether vested or not, that have been earned by the participants covered by the plan as of the date at which the determination is made. These other benefits include any death, early retirement or disability benefits provided under the plan.

Actuarial accrued liability

Equal to the actuarial present value of future benefits less the present value of future annual normal costs.

Actuarial cost method

The method for allocating the actuarial present value of a pension plan's benefits and expenses to various time periods. An actuarial cost method is also referred to as a funding method.

Actuarial gain/(loss)

The difference between the plan's actual experience and that expected based upon a set of actuarial assumptions. A gain occurs when the experience of the plan is more favorable (in terms of cost) than the assumptions projected; a loss occurs when experience is less favorable. May also be referred to as experience gains/(losses).

Actuarial present value

See present value.

Actuarial valuation

The determination, as of a valuation date, of the annual normal cost, actuarial accrued liability, actuarial value of assets and related actuarial present values for a pension plan.

Actuarial value of assets

The value of cash, investments and other property belonging to a pension plan determined by the actuary for the purpose of an actuarial valuation. Actuarial asset methods are generally designed to reduce fluctuations in asset value due to large variations in returns from year to year. Actuarial values are generally a smoothed market value that recognize gains and losses over time.

Amortization

The spreading of a present value or a cost over a period of years. A plan's unfunded actuarial accrued liability is amortized over a period of years.

Section 3 (continued)

3.9 Definition of Actuarial Terms

Fiscal year

The year on which the plan sponsor maintains its financial records.

Funded

Provided by plan assets. A liability is fully funded when assets exceed or equal the liability.

Normal cost

That portion of the actuarial present value of pension plan benefits and expenses which is allocated to a valuation year by the actuarial cost method.

Normal retirement age

An age defined in the plan for purposes of establishing when a terminated participant is entitled to an accrued benefit.

Normal retirement benefit

The benefit payable when it commences at the normal retirement age.

Participant

A person covered by a pension plan in accordance with its terms including active participants, retired participants and beneficiaries, vested terminations and vested transfers.

Plan year

The year on which the plan maintains its financial records.

Present value

The value of an amount or series of amounts payable at various times, determined as of a given date by the application based on a particular set of actuarial assumptions. It is a single sum which reflects the time value of money and the probabilities of payment.

Rate of return

The actual or expected investment income as a percentage of a plan's average assets.

System

Public School Retirement System of the City of St. Louis, Missouri.

Unfunded actuarial accrued liability

The excess of the actuarial accrued liability over the actuarial value of assets.

Vested benefit

A benefit that is not forfeited if the participant terminates employment.

CONDUENT

Public School Retirement System of the City of St. Louis, Missouri

2018 Valuation Results

June 18, 2018

Data – Population as of 1/1/2018

	2018	2017	Change
Retirees and Beneficiaries	4,526	4,561	-35
Inactives	2,791	2,554	237
Actives			
School District	3,733	3,808	-75
Charter Schools	1,398	1,286	112
Retirement System	7	7	0
Total Actives	5,138	5,101	37
Total	12,455	12,216	239

Data – Member Census Information

	As of January 1	
	2018	**2017**
Active Members		
Number	5,138	5,101
Average Age	43.53	43.68
Average Service	7.64	7.82
Average Annual Base Pay	$51,727	$51,014
Vested Terminated Members		
Number	549	522
Average Account Balance	$30,722	$29,781
Non-vested Terminated Members		
Number	2,242	2,032
Average Account Balance	$ 3,470	$ 3,585
Benefit Recipients		
Number	4,526	4,561
Average Age	74.29	74.03
Average Monthly Benefit	$ 1,951	$ 1,926

Valuation Results – Summary

CONDUENT

	January 1, 2018	January 1, 2017
System Assets		
Expense and contingency reserve	$ 30,751,247	$ 30,921,897
Market value, excluding expense & contingency reserve	883,331,012	819,258,525
Actuarial value	899,816,911	901,076,683
System liabilities		
Unfunded actuarial accrued liability	$ 252,911,307	$ 232,478,771
Projected unit credit liability	$ 1,235,909,034	$ 1,223,329,683
Entry Age Normal liability	$ 1,266,012,715	$ 1,258,219,915
Funding Ratio (PUC)		
Actuarial value funding ratio	72.8%	73.7%
Market value funding ratio	71.5%	67.0%
Funding Ratio (EAN)		
Actuarial value funding ratio	71.1%	71.6%
Market value funding ratio	69.8%	65.1%
Employer Cost		
Actuarially Determined Rate	17.72%	19.10%
Statutory Required Rate	16.00%	N/A

Valuation Results – Annual Required Contribution

CONDUENT

	2018 Valuation	2017 Valuation	Increase / (Decrease)
Normal cost contribution	21,038,975	26,350,187	(5,311,212)
Actuarial accrued liability contribution	26,057,188	23,343,402	2,713,786
Actuarially determined contribution (ADC)	47,096,163	49,693,589	(2,597,426)
Covered compensation	265,773,659	260,223,066	5,550,593
ADC as % of covered payroll	17.72%	19.10%	(1.38)%
Statutory required contribution rate	16.00%	N/A	N/A
Statutory annual required contribution (ARC)	42,523,785	N/A	N/A

Valuation Results – Contribution Amounts by Employer Group:

	Board of Education	Retirement System	Charter Schools	Total
Normal cost contribution	$15,508,017	$ 44,028	$5,486,930	$21,038,975
Actuarial accrued liability contribution	19,206,986	54,530	6,795,672	$26,057,188
Actuarially determined contribution (ADC)	34,715,003	98,558	12,282,602	$47,096,163
Covered payroll	195,904,143	556,184	69,313,332	$265,773,659
ADC as % of covered compensation	17.72%	17.72%	17.72%	17.72%
Statutory Annual Required contribution:				
Covered payroll	195,904,143	556,184	69,313,332	$265,773,659
ARC as % of covered payroll	16.00%	16.00%	16.00%	16.00%
Statutory annual required contribution (ARC)	31,344,663	88,989	11,090,133	$42,523,785

Gain/Loss – Liability

CONDUENT

	Dollar amounts in millions
A. 2017 Entry Age Normal Liability	$1,258.2
B. Expected 2018 Entry Age Normal Liability	$1,227.5
C. Impact of plan changes	$16.7
D. Actual 2018 Entry Age Normal Liability	$1,266.0
Gain / (Loss): B + C - D	$(21.8)
Gain / (Loss) as a Percent of Expected	(1.8)%

Gain/Loss – Assets

CONDUENT

	Actuarial Value of Assets ($ in millions)	Market Value of Assets ($ in millions)
A. 2017 Assets	$901.1	$850.2
B. Expected 2018 Assets	$903.9	$849.2
C. Actual 2018 Assets	$899.8	$914.1
D. Gain/(Loss): C – B	$(4.1)	$64.9
E. Expected Return	7.5%	7.5%
F. Actual Return	6.85%	15.22%
G. Gain/(Loss): F - E	(.65)%	7.72%

Actual return calculation assumes mid-year cash flows

Certification

The results were prepared under the direction of Troy Jaros who meets the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein. These results have been prepared in accordance with all applicable Actuarial Standards of Practice, and we are available to answer questions about them.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law.

The assumptions, methods, asset information and data information are presented in the January 1, 2018 actuarial report. The data and asset information have been updated for results contained in this presentation and reflects information provided by the Plan sponsor. All of the statements of reliance, assumptions, descriptions and caveats in the actuarial valuation report are incorporated by reference.

Where presented, references to “funded ratio” and “unfunded accrued liability” typically are measured on an actuarial value of assets basis. It should be noted that the same measurements using market value of assets would result in different funded ratios and unfunded accrued liabilities. Moreover, the funded ratio presented is appropriate for evaluating the need and level of future contributions but makes no assessment regarding the funded status of the plan if the plan were to settle (i.e. purchase annuities) for a portion or all of its liabilities.

Troy Jaros, FSA, EA, MAAA, FCA

Senior Consultant, Retirement Actuary

CONDUENT

Any Final Questions on the Valuation?

Request Board Approval of Report Results

CONDUENT™

CONDUENT
231 S. Bemiston, Suite 400
St. Louis, MO 63105

June 8, 2018

Mr. Andrew Clark
Executive Director
PSRS of the City of St. Louis
3641 Olive Street, Suite 300
St. Louis, MO 63108-3601

Re: Public School Retirement System of the City of St. Louis, Missouri
GASB 67 & GASB 68 Disclosures for Fiscal Year Ending December 31, 2017

Dear Members of the Board:

We have prepared certain required liability and asset accounting information for Governmental Accounting Standards Board (GASB) Statement No. 67 and GASB Statement No. 68 for The Public School Retirement System of the City of St. Louis, Missouri (PSRS) for fiscal year ending December 31, 2017.

Please note that GASB Statement No. 25 (*Financial Reporting for Defined Benefit Pension Plans*) is applicable for fiscal years ending prior to 2014 and has been replaced by GASB Statement No. 67 (*Financial Reporting for Pension Plans)* for fiscal years ending 2014 and later. Similarly, GASB Statement No. 27 (*Accounting for Pensions by State and Local Governmental Employers*) is applicable for fiscal years ending prior to 2015 and has been replaced by GASB Statement No. 68 (*Accounting and Financial Reporting for Pensions*) for fiscal years ending 2015 and later.

GASB Statement No. 67

GASB Statement No. 67 set forth certain items of information to be disclosed in the financial statements of the Plan.

1. Following is the schedule of Net Pension Liability.

Net Pension Liability (Asset)

Total Pension Liability	$ 1,673,122,191
Plan Fiduciary Net Position	914,082,259
Net Pension Liability (Asset)	$ 759,039,932
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability (Asset)	54.63%

2. Following is the sensitivity of the net pension liability to changes in the discount rate.

Sensitivity of the Net Pension Liability
To Changes in the Discount Rate

	1% Decrease	Current	1% Increase
Discount Rate	3.78%	4.78%	5.78%
Net Pension Liability (Asset)	961,985,980	759,039,932	590,565,070

3. The discount rate used to measure the total pension liability was 4.78%. The projection of cash flows used to determine the discount rate assumed that System contributions will continue to follow the current funding policy. Based on those assumptions, the System's fiduciary net position was projected to be insufficient to make all projected future benefit payments of current plan members. A municipal bond rate of 3.16% was used in the development of the blended GASB discount rate after that point. The 3.16% rate is based on the S&P Municipal Bond 20 Year High Grade Rate Index as of December 31, 2017. Based on the long-term rate of return of 7.50% and the municipal bond rate of 3.16%, the blended GASB discount rate would be 4.78%. Please see Appendix A for additional detail.

4. A schedule of changes in the net pension liability for the year ending December 31, 2017 is provided in Appendix B.

5. Under GASB Statement No. 68, employers participating in the plan would recognize a total pension expense of $193,026,507 for their fiscal year beginning after June 15, 2017. Details of this calculation are included in Appendix C.

6. Summary of Significant Accounting Policies.

   - **Method used to value investments**. Investments are reported at fair value.

   - **Actuarial cost method**. Entry Age Normal – Level Percent of Pay Method.

The plan sponsor selected the assumptions used for the accounting results in this letter, based on a study of actual Plan experience for the five years ending December 31, 2015. We believe that these assumptions are reasonable and comply with the requirements of GASB Statement No. 67 and GASB Statement No. 68, as applicable. We prepared this letter in accordance with the requirements of this standard. Full summaries of the assumptions, methods and plan provisions used in the preparation of this required accounting information are provided in Appendix D through Appendix F.

Changes in assumptions from the disclosure as of December 31, 2016 are as follows:

- The municipal bond rate changed to 3.16% from 3.71%.

- The blended discount rate changed to 4.78% from 7.50%.

Changes in plan provisions from the disclosure as of December 31, 2016 are as follows:

- Reduce the "Rule of 85" unreduced retirement from age plus service equal to 85 to 80 (i.e. change it to a "Rule of 80").

- Change the percent of pay benefit multiplier from 2.00% of Average Final Compensation to 1.75% of Average Final Compensation for members hired on or after January 1, 2018.

- For employees hired before January 1, 2018, increase the employee contribution requirement from a flat 5.0% of compensation during 2017 to 9.0% in 0.5% annual increments. For employees hired on or after January 1, 2018, the employee contribution requirement will be a flat 9.0% immediately upon entering the system.

- The employer contribution rate will be set at a flat 16.0% of covered payroll for Plan Year 2018. This contribution rate shall be decreased by 0.5% in each subsequent Plan Year until reaching 9.0% of covered payroll. After this, the employer contribution rate will remain at 9.0% of covered payroll.

Conduent performed the valuation using participant data and financial data supplied by the Retirement Systems staff. Conduent reviewed the data for reasonableness and consistency with data for the prior valuation, but performed no audit of the data. The results of the valuation are dependent on the accuracy of the data.

The primary purpose of this letter is to provide information for the PSRS of St. Louis. Use of this report for any other purposes or by anyone other than the PSRS of St. Louis and its auditors may not be appropriate and may result in mistaken conclusions because of failure to understand applicable assumptions, methods, or inapplicability of the report for that purpose. Because of the risk of misinterpretation of actuarial results, you should ask us to review any statement you wish to make on the results contained in this report. Conduent will accept no liability for any such statement made without our prior review.

Future actuarial measurements may differ significantly from current measurements due to plan experience differing from that anticipated by the economic and demographic assumptions, increases or decreases expected as part of the natural operation of the methodology used for these measurements, and changes in plan provisions or applicable law. Because of limited scope, Conduent performed no analysis of the potential range of such future differences other than the sensitivity to changes in the discount rate required by GASB Statement No. 67.

The undersigned meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained in this report. This report has been prepared in accordance with all applicable Actuarial Standards of Practice, and I am available to answer questions about it.

Please let me know if you require additional information.

Sincerely,

Troy Jaros, FSA, EA, MAAA, FCA
Senior Consultant, Retirement Actuary
Conduent Human Resource Services

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Appendix A, Table 1 – Projection of Fiduciary Net Position (000's omitted)

Year	Projected Beginning Fiduciary Net Position	Projected Total Contributions	Projected Benefit Payments	Projected Investment Earnings	Projected Ending Fiduciary Net Position
2018	$ 914,082	$ 55,209	$ 110,114	$ 64,899	$ 924,076
2019	$ 924,076	$ 42,943	$ 110,496	$ 65,590	$ 922,112
2020	$ 922,112	$ 38,113	$ 109,535	$ 65,446	$ 916,137
2021	$ 916,137	$ 34,422	$ 108,420	$ 65,016	$ 907,154
2022	$ 907,154	$ 31,440	$ 108,784	$ 64,310	$ 894,120
2023	$ 894,120	$ 28,905	$ 108,929	$ 63,311	$ 877,407
2024	$ 877,407	$ 26,600	$ 108,440	$ 62,061	$ 857,629
2025	$ 857,629	$ 24,514	$ 108,140	$ 60,576	$ 834,579
2026	$ 834,579	$ 22,577	$ 106,896	$ 58,881	$ 809,142
2027	$ 809,142	$ 20,788	$ 106,997	$ 56,958	$ 779,891
2028	$ 779,891	$ 19,124	$ 106,141	$ 54,785	$ 747,658
2029	$ 747,658	$ 17,568	$ 105,483	$ 52,381	$ 712,125
2030	$ 712,125	$ 16,136	$ 105,755	$ 49,696	$ 672,202
2031	$ 672,202	$ 14,776	$ 104,730	$ 46,730	$ 628,978
2032	$ 628,978	$ 13,524	$ 104,119	$ 43,502	$ 581,884
2033	$ 581,884	$ 12,350	$ 104,187	$ 39,958	$ 530,005
2034	$ 530,005	$ 11,561	$ 103,649	$ 36,078	$ 473,996
2035	$ 473,996	$ 10,806	$ 103,825	$ 31,862	$ 412,839
2036	$ 412,839	$ 10,078	$ 102,251	$ 27,326	$ 347,992
2037	$ 347,992	$ 9,397	$ 102,199	$ 22,457	$ 277,647
2038	$ 277,647	$ 8,759	$ 101,253	$ 17,210	$ 202,362
2039	$ 202,362	$ 8,158	$ 100,678	$ 11,579	$ 121,420
2040	$ 121,420	$ 7,595	$ 99,894	$ 5,532	$ 34,654
2041	$ 34,654	$ 7,065	$ 98,355	$ (923)	$ (57,559)
2042	$ (57,559)	$ 6,593	$ 98,092	$ (7,833)	$ (156,891)

Appendix A, Table 2 – Actuarial Present Values of Projected Benefit Payments (000's omitted)

Fiscal Year Ending 12/31	Beginning Fiduciary Net Position	Benefit Payments	Benefit Payments: Funded Portion	Benefit Payments: Unfunded Portion	Present Value of Benefit Payments: Funded Portion at 7.50%	Present Value of Benefit Payments: Unfunded Portion at 3.16%	Present Value of Benefit Payments: Using a Single Discount Rate of 4.78%
2018	$ 914,082	$ 110,114	110,114	-	$ 106,203	-	$ 107,573
2019	$ 924,076	$ 110,496	110,496	-	99,137	-	103,022
2020	$ 922,112	$ 109,535	109,535	-	91,418	-	97,466
2021	$ 916,137	$ 108,420	108,420	-	84,174	-	92,074
2022	$ 907,154	$ 108,784	108,784	-	78,565	-	88,168
2023	$ 894,120	$ 108,929	108,929	-	73,181	-	84,258
2024	$ 877,407	$ 108,440	108,440	-	67,770	-	80,054
2025	$ 857,629	$ 108,140	108,140	-	62,867	-	76,190
2026	$ 834,579	$ 106,896	106,896	-	57,808	-	71,878
2027	$ 809,142	$ 106,997	106,997	-	53,826	-	68,664
2028	$ 779,891	$ 106,141	106,141	-	49,670	-	65,007
2029	$ 747,658	$ 105,483	105,483	-	45,918	-	61,657
2030	$ 712,125	$ 105,755	105,755	-	42,825	-	58,996
2031	$ 672,202	$ 104,730	104,730	-	39,451	-	55,759
2032	$ 628,978	$ 104,119	104,119	-	36,485	-	52,905
2033	$ 581,884	$ 104,187	104,187	-	33,961	-	50,524
2034	$ 530,005	$ 103,649	103,649	-	31,429	-	47,970
2035	$ 473,996	$ 103,825	103,825	-	29,286	-	45,859
2036	$ 412,839	$ 102,251	102,251	-	26,830	-	43,104
2037	$ 347,992	$ 102,199	102,199	-	24,945	-	41,117
2038	$ 277,647	$ 101,253	101,253	-	22,990	-	38,878
2039	$ 202,362	$ 100,678	100,678	-	21,264	-	36,893
2040	$ 121,420	$ 99,894	99,894	-	19,627	-	34,936
2041	$ 34,654	$ 98,355	-	98,355	-	47,346	32,829
2042	$ (57,559)	$ 98,092	-	96,231	-	45,772	31,247

Appendix B – Schedule of Changes in System's Net Pension Liability and Related Ratios

	2016	2017
Total pension liability		
Service cost	$ 19,260,511	$ 19,950,269
Interest	92,358,115	92,276,865
Changes of benefit terms	0	18,979,978
Differences between expected and actual experience	6,392,416	(8,215,370)
Changes of assumptions	70,532,232	397,218,720
Benefit payments	(113,608,409)	(112,950,471)
Net change in total pension liability	74,934,865	407,259,991
Total pension liability-beginning	1,190,927,335	1,265,862,200
Total pension liability-ending (a)	1,265,862,200	1,673,122,191
Plan fiduciary net pension		
Contributions-employer	$ 39,519,979	$ 41,077,344
Contributions-employee	12,652,029	12,591,552
Net investment income	44,492,088	124,796,919
Benefit payments, including refunds of employee contributions	(113,608,409)	(112,950,471)
Administrative expense	(1,554,314)	(1,613,507)
Other	0	0
Net change in plan fiduciary net position	(18,498,627)	63,901,837
Plan fiduciary net position-beginning	868,679,049	850,180,422
Plan fiduciary net position-ending (b)	850,180,422	914,082,259
System's net pension liability-ending (a)-(b)	415,681,778	759,039,932
Plan fiduciary net position as a percentage of the total pension liability	67.16%	54.63%
Covered-employee payroll	$ 226,842,483	$ 235,132,592
Net pension liability as a percentage of covered-employee Payroll	183.25%	322.81

Notes to Schedule:

A. Benefit changes

- Reduce the "Rule of 85" unreduced retirement from age plus service equal to 85 to 80 (i.e. change it to a "Rule of 80").
- Change the percent of pay benefit multiplier from 2.00% of Average Final Compensation to 1.75% of Average Final Compensation for members hired on or after January 1, 2018.
- For employees hired before January 1, 2018, increase the employee contribution requirement from a flat 5.0% of compensation during 2017 to 9.0% in 0.5% annual increments. For employees hired on or after January 1, 2018, the employee contribution requirement will be a flat 9.0% immediately upon entering the system.
- The employer contribution rate will be set at a flat 16.0% of covered payroll for Plan Year 2018. This contribution rate shall be decreased by 0.5% in each subsequent Plan Year until reaching 9.0% of covered payroll. After this, the employer contribution rate will remain at 9.0% of covered payroll.

B. Changes of assumptions

- Blended Discount rate was changed from 7.50% to 4.78%.

Appendix C – Pension Expense and Deferred Inflows & Outflows of Resources Related to Pensions

Table 1: Pension Expense

Under GASB 68, employers participating in the Plan would recognize a total pension expense of $193,026,507 for the fiscal year beginning after June 15, 2017 which has been determined as of December 31, 2017. The corresponding results for the previous fiscal year determined as of December 31, 2016 are shown for comparison purposes.

Pension Expense	2016	2017
Service cost	$19,260,511	$19,950,269
Interest cost	92,358,115	92,276,865
Projected earnings on plan investments	(67,084,144)	(61,580,661)
Employee contributions	(12,652,029)	(12,591,552)
Administrative expense	1,554,314	1,613,507
Current period		
Changes of benefit terms	0	18,979,978
Changes in assumptions	17,633,058	104,531,243
Differences between expected and actual experience	1,598,104	(2,161,940)
Differences between projected and actual investment earnings	4,518,412	(12,643,252)
Recognition of prior years'		
Deferred inflows	(2,287,579)	(2,287,579)
Deferred outflows	23,190,055	46,939,629
Other changes in fiduciary net position	0	0
Total pension expense	$78,088,817	$193,026,507

For 2017, the additional liability due to changes in benefit terms is fully recognized.

For 2017, the additional liability due to changes in actuarial assumptions is recognized over the average expected remaining service lives of active and inactive members as of January 1, 2017 (3.8 years).

For 2017, the difference between expected and actual experience is recognized over the average expected remaining service lives of active and inactive members as of January 1, 2017 (3.8 years).

The difference between projected and actual investment earnings is recognized over 5.0 years.

Details of the deferred inflows and outflows of resources are shown in Table 2, Table 3, and Table 4.

Appendix C – Pension Expense and Deferred Inflows & Outflows of Resources and Related to Pensions

Table 2: Amortization of Differences between Expected and Actual Liability Experience

Measurement Year	2014	2015	2016	2017	2018
Amount Established	$ 0	$ (10,065,347)	$ 6,392,416	$ (8,215,370)	
Recognition Period		4.4	4.0	3.8	
Annual Recognition		$ (2,287,579)	$ 1,598,104	$ (2,161,940)	

Measurement Year	Amount Recognized					Outflows	Inflows	Total
	2014	2015	2016	2017	2018			
2014	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
2015	0	(2,287,579)	0	0	0	0	(2,287,579)	(2,287,579)
2016	0	(2,287,579)	1,598,104	0	0	1,598,104	(2,287,579)	(689,475)
2017	0	(2,287,579)	1,598,104	(2,161,940)	0	1,598,104	(4,449,519)	(2,851,415)
2018	0	(2,287,579)	1,598,104	(2,161,940)	0	1,598,104	(4,449,519)	(2,851,415)
2019	0	(915,031)	1,598,104	(2,161,940)	0	1,598,104	(3,076,971)	(1,478,867)
2020	0	0	0	(1,729,550)	0	0	(1,729,550)	(1,729,550)
2021	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0

Measurement Year	Deferred Balance					Outflows	Inflows	Total
	2014	2015	2016	2017	2018			
2014	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
2015	0	(7,777,768)	0	0	0	0	(7,777,768)	(7,777,768)
2016	0	(5,490,189)	4,794,312	0	0	4,794,312	(5,490,189)	(695,877)
2017	0	(3,202,610)	3,196,208	(6,053,430)	0	3,196,208	(9,256,040)	(6,059,832)
2018	0	(915,031)	1,598,104	(3,891,490)	0	1,598,104	(4,806,521)	(3,208,417)
2019	0	0	0	(1,729,550)	0	0	(1,729,550)	(1,729,550)
2020	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0

Appendix C – Pension Expense and Deferred Inflows & Outflows of Resources and Related to Pensions

Table 3: Amortization of Additional Liability Attributable to Actuarial Assumption Changes

Measurement Year	2014	2015	2016	2017	2018
Amount Established			$ 70,532,232	$ 397,218,720	
Recognition Period			4.0	3.8	
Annual Recognition			$ 17,633,058	$ 104,531,243	

Measurement Year	Amount Recognized					Outflows	Inflows	Total
	2014	2015	2016	2017	2018			
2014	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
2015	0	0	0	0	0	0	0	0
2016	0	0	17,633,058	0	0	17,633,058	0	17,633,058
2017	0	0	17,633,058	104,531,243	0	122,164,301	0	122,164,301
2018	0	0	17,633,058	104,531,243	0	122,164,301	0	122,164,301
2019	0	0	17,633,058	104,531,243	0	122,164,301	0	122,164,301
2020	0	0	0	83,624,991	0	83,624,991	0	83,624,991
2021	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0

Measurement Year	Deferred Balance					Outflows	Inflows	Total
	2014	2015	2016	2017	2018			
2014	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0	$ 0
2015	0	0	0	0	0	0	0	0
2016	0	0	52,899,174	0	0	52,899,174	0	52,899,174
2017	0	0	35,266,116	292,687,477	0	327,953,593	0	327,953,593
2018	0	0	17,633,058	188,156,234	0	205,789,292	0	205,789,292
2019	0	0	0	83,624,991	0	83,624,991	0	83,624,991
2020	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0

Appendix C – Pension Expense and Deferred Inflows & Outflows of Resources and Related to Pensions

Table 4: Amortization of Differences between Projected and Actual Earnings

Measurement Year	2014	2015	2016	2017	2018
Amount Established	$ 38,046,679	$ 77,903,595	$ 22,592,056	$ (63,216,258)	
Recognition Period	5.0	5.0	5.0	5.0	
Annual Recognition	$ 7,609,336	$ 15,580,719	$ 4,518,412	$ (12,643,252)	

Measurement Year	Amount Recognized					Outflows	Inflows	Total
	2014	2015	2016	2017	2018			
2014	$ 7,609,336	$ 0	$ 0	$ 0	$ 0	$ 7,609,336	$ 0	$ 7,609,336
2015	7,609,336	15,580,719	0	0	0	23,190,055	0	23,190,055
2016	7,609,336	15,580,719	4,518,412	0	0	27,708,467	0	27,708,467
2017	7,609,336	15,580,719	4,518,412	(12,643,252)	0	27,708,467	(12,643,252)	15,065,215
2018	7,609,335	15,580,719	4,518,412	(12,643,252)	0	27,708,466	(12,643,252)	15,065,214
2019	0	15,580,719	4,518,412	(12,643,252)	0	20,099,131	(12,643,252)	7,455,879
2020	0	0	4,518,408	(12,643,252)	0	4,518,408	(12,643,252)	(8,124,844)
2021	0	0	0	(12,643,250)	0	0	(12,643,250)	(12,643,250)
2022	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0

Measurement Year	Deferred Balance					Outflows	Inflows	Total
	2014	2015	2016	2017	2018			
2014	$ 30,437,343	$ 0	$ 0	$ 0	$ 0	$ 30,437,343	$ 0	$ 30,437,343
2015	22,828,007	62,322,876	0	0	0	85,150,883	0	85,150,883
2016	15,218,671	46,742,157	18,073,644	0	0	80,034,472	0	80,034,472
2017	7,609,335	31,161,438	13,555,232	(50,573,006)	0	52,326,005	(50,573,006)	1,752,999
2018	0	15,580,719	9,036,820	(37,929,754)	0	24,617,539	(37,929,754)	(13,312,215)
2019	0	0	4,518,408	(25,286,502)	0	4,518,408	(25,286,502)	(20,768,094)
2020	0	0	0	(12,643,250)	0	0	(12,643,250)	(12,643,250)
2021	0	0	0	0	0	0	0	0
2022	0	0	0	0	0	0	0	0
2023	0	0	0	0	0	0	0	0

Appendix C – Pension Expense and Deferred Inflows & Outflows of Resources and Related to Pensions

Table 5: Employer Allocation Percentage

EMPLOYER	Total Employer Payroll	Ratio of Employer Payroll over Total Payroll
Retirement System	$ 535,096	0.23%
Board of Education	$ 175,741,386	74.74%
Charter Schools		
The Arch Community School	$ 176,366	0.88%
Confluence Academy	$ 14,138,330	6.01%
City Garden Montessori School	$ 1,600,524	0.68%
Gateway Science Academy of St. Louis	$ 5,785,082	2.46%
KIPP Inspire Academy	$ 8,155,182	3.47%
Lift for Life Academy	$ 3,601,413	1.53%
North Side Community School	$ 2,126,487	0.90%
Preclarus Mastery Academy	$ 754,013	0.32%
South City Preparatory Academy	$ 1,917,863	0.82%
St. Louis Language Immersion School	$ 3,177,575	1.35%
Premier Charter School (formerly St. Louis Charter School)	$ 5,915,343	2.52%
EAGLE College Preparatory School	$ 2,236,495	0.95%
Grand Center Arts Academy	$ 3,124,331	1.33%
Lafayette Preparatory Academy	$ 1,364,175	0.58%
Carondelet Leadership Academy	$ 2,269,316	0.97%
Hawthorne Leadership School for Girls	$ 1,210,545	0.51%
The Biome	$ 610,529	0.26%
La Salle Middle School	$ 692,541	0.29%
Total Charter Schools	$ 58,856,110	25.03%
TOTAL	$ 235,132,592*	100.00%*

* Totals may differ from summation of the individual components due to rounding

Appendix D – Assumptions and Methods

In this appendix, "2017 valuation report" refers to the actuarial valuation report issued in July 2017.

Interest

7.50% per annum.

Participant account interest crediting rate

5.0% per annum.

Expenses

The rate of interest assumed is net of expenses.

Mortality

a) RP-2014 Combined Healthy Mortality Table (rolled back to 2006) for active Members, and deferred vested Members, projected fully generationally using projection scale MP-2015.

b) RP-2014 Combined Healthy Mortality Table (rolled back to 2006) for Inactive Members receiving benefits adjusted by an additional 10% to account for the higher mortality experienced by the Plan, projected fully generationally using projection scale MP-2015.

Disability Mortality

The RP-2014 Disabled Mortality Table (rolled back to 2006) for disabled retired Members, projected fully generationally using projection scale MP-2015.

Withdrawal

Withdrawals are assumed to occur at rates based on actual experience of the retirement system. During the first five years of membership, withdrawals are assumed to occur at the following rates:

Year of Membership	Non-charter school employees	Charter school employees
1st	25.0%	35.0%
2nd	20.0%	35.0%
3rd	20.0%	35.0%
4th	20.0%	25.0%
5th	15.0%	15.0%

The rates used after the first five years of membership are shown in Table 1 of Appendix F.

Salary scale

Salaries are assumed to increase at the rate of 5.00% per year for the first 5 years of employment and 3.50% per year thereafter.

Disability

Disabilities are assumed to occur at rates based on the actual experience of the retirement system. The rates are shown in Table 3 of the 2017 valuation report.

Appendix D – Assumptions and Methods (continued)

Retirement

Retirements occur at rates based on the actual experience of the retirement system. The age-related rates used are shown in Table 2 of Appendix F.

Family Structure

The probability of a participant being married and the probable number of children are based on a table constructed by the Social Security Administration, modified to reflect the experience of the retirement system. The rates used are shown in Table 4 of the 2017 valuation report. For married participants, husbands are assumed to be 3 years older than their wives.

Usage of Cash-out Option

Participants terminating in vested status are given the option of taking a refund of their accumulated participant contributions instead of a deferred retirement benefit. Active members who terminate in the future with a vested benefit are assumed to take a deferred vested annuity, unless a refund of contributions and interest is greater than the actuarial present value of their vested deferred benefit.

Future Benefit Increases or Additional Benefits

When funding is adequate, the Board may authorize cost of living adjustments (COLAs), as noted in the summary of plan provisions. In the past, the Board has also sometimes granted an additional monthly payment to retirees (13th check.) This valuation assumes that no future COLAs and no future 13th checks will be awarded.

Actuarial Method – Frozen Entry Age (Funding Purposes)

The actuarial cost method used by the System is the "frozen entry age actuarial cost method." Under this method, on the initial actuarial valuation date for which the cost method is used, the annual cost accruals (individual normal costs for each participant) are determined as a level percentage of pay for each year from entry age until retirement or termination. The UFAAL was originally determined as of January 1, 1981. Entry age is determined at the date each participant would have entered the System. The sum of these individual normal costs for all active participants whose attained ages are under the assumed retirement age is the normal cost for the initial plan year. The excess of all normal costs falling due prior to the initial actuarial valuation date, accumulated with interest, over the plan assets establishes the initial Unfunded Frozen Actuarial Accrued Liability (UFAAL).

The UFAAL is only frozen in that it is not adjusted due to experience gains and losses. Instead, gains and losses are reflected through changes in the normal cost accrual rate. The UFAAL does change, increasing due to interest and additional normal costs, and decreasing due to contributions. Any changes to plan provisions or actuarial assumptions results in a change to the UFAAL. The amount of the change is determined by computing the impact in the actuarial accrued liability as of the valuation date coincident with or next following the change.

Appendix D – Assumptions and Methods (continued)

Normal costs are calculated as the level percentage of pay required to fund the excess of the actuarial present value of future benefits over the sum of the actuarial value of current assets and the remaining UFAAL.

Effective January 1, 2006, UFAAL was reestablished to better reflect an appropriate relationship between the normal cost and the actuarial accrued liability.

The funding requirement for each plan year is the sum of the "normal cost contribution" (equal to the normal cost for that year), plus the "actuarial accrued liability contribution." The "actuarial accrued liability contribution" is the payment required to amortize the UFAAL over 30 years, from January 1, 2006, the date that it was reestablished.

Valuation of Assets (Funding Purposes)

The actuarial value of assets is determined using the assumed yield method of valuing assets. Under the assumed yield asset valuation method, the prior year's actuarial value is increased at the assumed rate of return with appropriate adjustments for contributions and disbursements to produce an expected actuarial value of assets at the end of the year. The expected actuarial value is compared to the market value of assets less the expense and contingency reserve, and 20% of the difference is added to the expected actuarial value. The actuarial value of assets was "fresh-started" as of January 1, 2006 and set equal to the market value of assets as of that date.

Assumption Changes effective as of Year-end 2017:

None

Appendix E – Summary of Plan Provisions

Participants

All persons regularly employed by the board of education, charter schools, and employees of the board of trustees are in the System.

Retirement age

Normal

Age 65 or any age if age plus the years of credited service equals or exceeds 80 (Rule of 80)

Early

Age 60 with 5 years of service

Service retirement allowance

a. 2.00% (1.25% if terminated prior to July 1, 1999 and 1.75% if hired on or after January 1, 2018) times years of credited service, subject to a maximum of 60%
b. Times average final compensation (AFC)
c. Subject to a maximum of 60% of AFC.
    i. AFC is the highest average compensation for any three consecutive years of the last 10 years of service.
    ii. Compensation is the regular wages plus what your employer pays towards your health and welfare benefits.
    iii. Minimum monthly benefit is $10.00 for each year of credited service, up to 15 years, retirement age 65 and over.
    iv. Unused sick leave is added to a participant's credited service and age.

Early retirement benefit

Service retirement allowance reduced five-ninths of one percent for each month of commencement prior to age 65 or the age at which the Rule of 80 would have been satisfied had the employee continued working until that age, if earlier.

Disability benefit

Service retirement allowance using actual service, or 25% of AFC if larger, provided that in no case will the benefit exceed that payable if service had continued to age 65.

a. Disability must be incurred while an employee as determined by the medical board and approved by the board of trustees.
b. The participant must have a minimum of five years of credited service and not be eligible for normal retirement.

Continued disability is subject to routine verification.

Withdrawal benefit

Accumulated contributions of participant with interest credited to the participant's account.

Appendix E – Summary of Plan Provisions (continued)

Vested benefit

Full vesting on termination of employment after at least five years of service is provided if contributions are left with the System. The full accrued benefit is payable at age 65 or a reduced early retirement benefit prior to age 65.

Retirement options

In lieu of the benefit paid only over the lifetime of the participant, a reduced benefit payable for life of participant with:

Option 1	Same retirement allowance continued after death to the beneficiary.
Option 2	One-half of the retirement allowance continued after death to the beneficiary.
Option 3	Same retirement allowance continued after death to the beneficiary. If the beneficiary predeceases the participant, the retirement allowance is adjusted back to the unreduced allowance.
Option 4	One-half of retirement allowance continued after death to the beneficiary. If the beneficiary predeceases the participant, the retirement allowance is adjusted back to the unreduced allowance.
Option 5	Increased retirement allowance is provided up to age 62, such that benefit provided prior to age 62 is approximately equal to the sum of the reduced retirement allowance paid after age 62 and Social Security.
Option 6	Options 1 and 5 combined.
Option 7	Options 2 and 5 combined.

Survivor benefits

If an active participant dies after completing 18 months of service, leaving a surviving spouse or other dependent beneficiaries, survivor benefits are payable. The widow or dependent beneficiary may elect to receive either a refund of accumulated contributions, or:

a. A survivor who is the widow at least age 62 and married to a participant for at least one year receives $60 a month.
b. A widow with dependent, unmarried children under age 22 receives $60 a month plus $60 per dependent child, not to exceed $180 per month. The benefit ceases when youngest child is age 22 and resumes again under (a) at age 62.
c. If no benefits are payable under (a) or (b), minor children may receive a benefit of $60 per child or $180 divided among them if more than three children.
d. If no benefits are payable under (a), (b) or (c), a dependent parent or parents may receive or share $60 per month upon attaining age 62.

If an active participant dies after completing 5 years of service, the widow or dependent beneficiary may elect to receive either a refund of accumulated contributions or:

a. If the survivor is the widow, a survivor benefit calculated as if the participant had been age 60 at death and elected Option 1, plus $60 per dependent child not to exceed $180 per month.
b. If there is no widow, a survivor benefit calculated as if the participant had been age 60 at death and elected Option 1.

Appendix E – Summary of Plan Provisions (continued)

Return of contributions upon death

If after the death of a participant, no further monthly are payable to a beneficiary under an optional form of payment, or under the survivor benefit provisions, the participant's beneficiary shall be paid the excess, if any, of the participant's accumulated contributions over all payments made to or on behalf of the deceased participant.

DROP

Effective July 1, 2001, active participants may elect to enter the deferred retirement option plan (DROP) for up to four years. Upon entering the DROP, the participant's retirement benefit is frozen and credited to the participant's DROP account. At the end of the DROP, or upon earlier termination of employment, the DROP account is paid in a lump sum or installments, at the participant's option. During the DROP, the participant continues as an active participant, but does not pay contributions. To enter the DROP the participant must be age 65 or meet the Rule of 85. The DROP program is no longer available, ending June 30, 2008.

Contributions by participants

For employees hired before January 1, 2018, increase the employee contribution requirement from a flat 5.0% of compensation during 2017 to 9.0% in 0.5% annual increments. For employees hired on or after January 1, 2018, the employee contribution requirement will be a flat 9.0% immediately upon entering the system.

Contributions by employers

The employer contribution rate will be set at a flat 16.0% of covered payroll for Plan Year 2018. This contribution rate shall be decreased by 0.5% in each subsequent Plan Year until reaching 9.0% of covered payroll. After this, the employer contribution rate will remain at 9.0% of covered payroll.

Expenses

Administrative expenses paid out of investment income.

Provision Changes effective as of Year-end 2017:

1. Reduce the "Rule of 85" unreduced retirement from age plus service equal to 85 to 80 (i.e. change it to a "Rule of 80").

2. Change the percent of pay benefit multiplier from 2.00% of Average Final Compensation to 1.75% of Average Final Compensation for members hired on or after January 1, 2018.

3. For employees hired before January 1, 2018, increase the employee contribution requirement from a flat 5.0% of compensation during 2017 to 9.0% in 0.5% annual increments. For employees hired on or after January 1, 2018, the employee contribution requirement will be a flat 9.0% immediately upon entering the system.

4. The employer contribution rate will be set at a flat 16.0% of covered payroll for Plan Year 2018. This contribution rate shall be decreased by 0.5% in each subsequent Plan Year until reaching 9.0% of covered payroll. After this, the employer contribution rate will remain at 9.0% of covered payroll.

Appendix F – Tables of Assumptions

Table 1
Withdrawal Rates
Annual Rates Per 1,000 Members

Age	Rate	Age	Rate
20	204.0	45	44.0
21	197.0	46	41.0
22	190.0	47	37.0
23	184.0	48	34.0
24	177.0	49	31.0
25	171.0	50	28.0
26	161.0	51	26.0
27	151.0	52	25.0
28	141.0	53	24.0
29	131.0	54	23.0
30	121.0	55	22.0
31	117.0	56	21.0
32	112.0	57	20.0
33	108.0	58	19.0
34	103.0	59	18.0
35	99.0	60	17.0
36	96.0		
37	92.0		
38	89.0		
39	86.0		
40	83.0		
41	75.0		
42	67.0		
43	59.0		
44	52.0		

Appendix F – Tables of Assumptions (continued)

Table 2
Retirement Rates
Annual Rates Per 1,000 Members

Age	Rule of 80 Rate	Not Rule of 80 Rate
50-51	200.0	N/A
52-59	150.0	N/A
60	200.0	100.0
61	200.0	100.0
62	250.0	150.0
63	250.0	150.0
64	250.0	200.0
65	300.0	300.0
66	300.0	300.0
67	300.0	300.0
68	300.0	300.0
69	300.0	300.0
70 - 71	300.0	300.0
72	1,000.0	1,000.0