Public School
Retirement System
of the City of St. Louis

Actuarial Report
As of January 1, 2010

June 2010

Introduction

Purpose of the report

This report is submitted in accordance with Section 169.450-15 Revised Statutes of Missouri (R.S. Mo.) 1997 and amendments that require the actuary to make an annual valuation of the assets and liabilities of the system. The purpose of the actuarial valuation is twofold: (1) to determine the required annual contributions from the board of education and the retirement system; and (2) to develop information to measure the relative financial condition of the system.

The required contribution to the retirement system from the board of education, the retirement system, and the charter schools is computed in accordance with Section 169.490 R.S. Mo. 1997. The amount of the required contribution is stated in table C of this report. Descriptions of the actuarial cost method and assumptions appear in sections 2 and 3.

Information concerning the financial condition and factors affecting it will be found throughout the report. There is no generally accepted single measure or standard for determining whether or not a retirement system is "actuarially sound." The financial health of a retirement system is measured best by considering each of these in measures in relation to the others. In doing so, recognition of changes in funding levels and requirements need to also take into account changes in benefit provisions. The measure that often receives the most focus is the magnitude and stability of the contribution rate. A stable rate normally indicates that consistent progress is being made in the funding of the system's liabilities. The contribution adequacy is directly measured through the prioritized solvency test. The actuarial balance sheet also provides an indication of the financial condition of the plan by comparing the sources of both the system assets liabilities and the system liabilities.

Comments

This actuarial valuation is based on the same actuarial assumptions and methods as those used in the prior actuarial valuation. As a data refinement and to be consistent with the valuation treatment of other employees, compensation for new hires with the Charter schools during 2009 was annualized to reflect a full year's pay.

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 projected by the actuarial assumptions. The assumptions are based on the long-term expected experience of the system. Since actuarial gains (or losses) reflect short-term deviations between actual and expected experience, annual gains (or losses) should be expected.

For 2010, the annual normal cost rate increased from 2.75% to 4.85% due to actuarial losses of approximately $41 million. $24 million of the loss is attributable to the System's actuarial rate of return on assets which was 5.5%, 2.5% less than the assumed rate of return of 8.00%. By comparison, the rate of return on the market value of assets was 18.8%. The difference in these returns is because the actuarial value of assets has not yet fully recognized the asset losses that occurred during 2008. At January 1, 2010, the actuarial value of assets at $951 million remains above market value of assets by approximately $60 million. The remainder of the $41 million loss is attributable to demographic changes.

The normal cost is determined annually and equals the product of the normal cost rate times covered payroll. For 2010, the annual normal cost due December 31, 2010 is $12,673,767, as compared to $6,967,095 for 2009, primarily due to the aforementioned increase in the normal cost accrual rate. Covered payroll increased slightly from $234.6 million to $242.0 million with all of the growth attributable to payroll growth at the Charter schools.

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 2009 were $7.2 million more than the annual required contribution, which reduced the UFAAL more than expected. As a result, the amortization payment is reduced from $12,440,627 to $11,590,415.   In addition, it is being spread over a slightly larger payroll base so that the amortization payment component of the contribution rate drops from 5.3% to 4.8%, partially offsetting the increase in Normal Cost due to the experience loss.

As a part of the package to increase benefits in 2001, the board of education agreed to fix the employer contribution at 8.00% for 2001 and institute a one-year lag for future years. Therefore, this actuarial valuation is used to determine the actual contribution rate for 2011. The dollar amount of the actual contribution increased to $24,264,182 for 2011 from $19,407,727 for 2010. As a percentage of covered compensation, the contribution rate for 2011 increased to 10.03% from 8.27% for 2010.

The undersigned collectively meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Aon Consulting

Gary T Bayer, FSA, EA
Vice President

Public School Retirement System of the City of St. Louis

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Section 1

Summary of Principal Results of the
Actuarial Valuation as of January 1, 2010

Annual Required Contribution

	Board of education	Retirement system	Charter schools	Total
2010				
Normal cost contribution	$ 10,411,884	$ 30,276	$ 2,231,607	$ 12,673,767
Actuarial accrued liability contribution	9,521,877	27,688	2,040,850	$ 11,590,415
Annual required contribution	19,933,761	57,964	4,272,457	$ 24,264,182
Covered payroll	198,775,945	578,006	42,604,182	$ 241,958,133
ARC as % of covered payroll	10.03%	10.03%	10.03%	10.03%
2009*				
Normal cost contribution	$ 6,027,433	$ 17,453	$ 922,209	$ 6,967,095
Actuarial accrued liability contribution	10,762,743	31,164	1,646,720	12,440,627
Annual required contribution	$ 16,790,176	$ 48,617	$ 2,568,929	$ 19,407,727
Covered payroll	202,943,889	587,637	31,050,800	234,582,326
ARC as % of covered payroll	8.27%	8.27%	8.27%	8.27%

System Assets	January 1, 2010	January 1, 2009*
Expense and contingency reserve	$ 29,903,107	$ 30,553,388
Market value, excluding expense & contingency reserve	861,659,811	779,237,596
Actuarial value	950,709,944	963,851,408
System liabilities		
Unfunded actuarial accrued liability	$ 125,292,126	$ 136,040,308
Actuarial present value of projected accrued benefits	$1,111,070,953	1,093,606,648
Funding Ratio		
Actuarial value funding ratio	85.6%	88.1%
Market value funding ratio	77.6%	71.3%

*Prior year shown for comparison purposes

Section 2

Actuarial Methodology

Introduction

The actuarial valuation of a defined benefit retirement system is comprised of two separate processes.

First, the actuarial present value, as of the valuation date, of both current and projected benefits to be paid under the plan is determined. In determining the actuarial present value of these benefits, actuarial assumptions must be made as to the number of participants eventually receiving benefits, the amount of benefits to be paid, and the portion of the benefit obligation to be covered by future investment earnings.

Second, the financing of these benefit obligations on an advance basis is established. An actuarial cost method is applied to establish the normal cost and the actuarial accrued liability. The normal cost is the portion of costs which are assigned to the current year. The actuarial accrued liability represents the accumulation of normal costs that have theoretically been assigned to periods prior to the valuation date.

Actuarial assumptions

The true cost of a participant's retirement benefit is not known until he or his beneficiary has received the final benefit payment. Consequently, the exact cost of system benefits for the current employee group will not be determinable for approximately 75 years. Since provisions for this cost must be made prior to the exact determination, a model is created to estimate the future cost of system benefits. The model utilizes parameters that require assumptions as to the future occurrences of various events affecting the demographic profile of the employee group and the assets of the system. Such actuarial assumptions include death, retirement, termination, disability, salary increases and investment return. Current and long-term economic factors, the nature of the employer's business, and significant features of the system must be considered in the selection of a set of actuarial assumptions to assure the reasonableness of the results predicted by the assumptions. The suitability of actuarial assumptions is measured by how closely the experience of the system, on a long-term basis, conforms to projected results.

While care is taken in the selection of actuarial assumptions, actual experience is expected to deviate from these assumptions over the short term. Deviations from projected results are called actuarial gains and losses. Periodic actuarial valuations measure the extent of these gains and losses as of a valuation date. If either actuarial gains or losses tend to predominate over a number of valuations, then it is possible that one or more of the actuarial assumptions is no longer appropriate. Thus, actuarial assumptions are continually monitored for reasonableness and subsequent cost estimates may be modified, as it becomes appropriate. While individual assumptions are intended to be representative, it is the aggregate effect of all actuarial assumptions working together that determines the prevalence of gains and losses.

A formal analysis of the experience of the retirement system for the five-year period ending December 31, 2005 was performed. On the basis of that analysis, several actuarial assumptions were changed effective with the January 1, 2006 valuation. The next scheduled experience analysis is for the five-year period ending December 31, 2010.

Actuarial liabilities

Actuarial liabilities include the actuarial present value of all future benefits and expenses. To determine the actuarial present value of all future benefits, the probabilities of future events occurring that establish benefit payments are forecast utilizing the actuarial assumptions. Second, based on System provisions and current participant data, the amounts of benefits to be paid upon the occurrence of those events are

projected. Next, assumptions for survival among retired participants and beneficiaries are used to estimate the duration of these benefit payments. Each probable benefit payment is then discounted to the valuation date using the actuarial assumption for investment return. Finally, these discounted payments are summed to arrive at the total actuarial present value of benefits.

Actuarial assets

The actuarial assets at any time are equal to the sum of current assets, valued on an actuarial basis (the actuarial value of assets), plus future assets. Future assets will result from future contributions and future investment return on all assets.

Asset valuation method

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.

Actuarial balance sheet

The actuarial balance sheet of a retirement system displays the fundamental financial status of the system on the valuation date. As stated previously, the system liabilities are the sum of the actuarial present values of all future projected benefit payments to current active and inactive plan participants and beneficiaries. Current assets, valued on an actuarial basis, plus the actuarial present value of future employer and employee contributions comprise the total actuarial assets of the system.

The actuarial present value of future employer contributions is the only item on the balance sheet that is not directly determined by the system provisions, current assets, participant data and actuarial assumptions. In fact, the actuarial present value of future employer contributions is the balancing item and reflects the future employer funding requirements based on the existing participant population.

Actuarial cost method

To determine the funding requirements of the system, it is necessary to employ an actuarial cost method. The choice of the cost method does not affect the balance sheet financial status, which is a function only of the system provisions, actuarial assumptions, participant data and assets. However, the actuarial cost method has a direct impact on the incidence of the funding requirements.

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).

In subsequent years, 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. However the UFAAL, does change, increasing due to the addition of interest and additional normal costs, and decreasing due to contributions. Also supplements to the UFAAL occur if there are plan amendments or

actuarial assumption changes. Supplements are determined by computing the change in the actuarial accrued liability as of the valuation date coincident with or next following the change.

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.

Section 3

Actuarial Assumptions

The following actuarial assumptions were used in the valuation:

Interest
8% per annum, net of expenses.

Salary scale
Salaries are assumed to increase at the rate of 4.5% per year.

Mortality
The RP-2000 Combined Healthy Lives Mortality Table for males and females is used for active participants, retired participants and beneficiaries. Rates are shown in exhibit C.

Disability mortality
The RP-2000 Combined Healthy Lives Mortality Table for males and females is used for active participants, with ages set up five years. Rates are shown in exhibit D.

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

Withdrawal
Select and ultimate rates based on actual experience of the retirement system are used. The rates used for participants who have completed three or more years of participation are shown in exhibit E.

During the first three years of participation, the rates for participants employed by employers other than Charter Schools are:

Year of membership	Withdrawal rate	
	Males	Females
1	17.5%	15.0%
2	15.0%	12.5%
3	10.0%	10.0%

During the first three years of participation, the rates for participants at Charter Schools are:

Year of membership	Withdrawal rate	
	Males	Females
1	50.0%	50.0%
2	25.0%	25.0%
3	15.0%	15.0%

Retirement
Retirements are assumed to occur at rates based on the actual experience of the retirement system. Illustrative age-related rates are shown in exhibit E. Unless the age-related rate is greater, for those eligible to retire under the Rule of 85, it is assumed that 25% will retire when first eligible for unreduced benefits with at least 30 years of credited service.

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 table used is presented in exhibit F.

Retiree insurance
It is assumed that 80% of retirees enroll in the system's retiree healthcare insurance and that the monthly subsidy will remain at $89.10 per month.

Section 4

Results of the Actuarial Valuation as of January 1, 2010

This section of the report shows the development of the principal elements of the actuarial valuation and the analyses of the various elements affecting the results. The actuarial valuation is based on:

- Participant data as of January 1, 2010 – This data is summarized in exhibits G and H.
- The statutes in effect on January 1, 2010 – A summary of the principal provisions governing the system appears in exhibit A.
- Actuarial assumptions and methods – The assumptions appear in section 3 and exhibits C through F. The actuarial cost method is described in section 2.
- System assets as of January 1, 2010 – Fund values and summaries of fund activities and investment performance during 2009 are described later in section 5 under "Valuation of the System's Assets."

Determination of the annual contribution levels

The annual required contribution (ARC) is comprised of two elements -- the "normal cost contribution" and the "actuarial accrued liability contribution." The determination of the unfunded frozen actuarial accrued liability and the actuarial accrued liability contribution follows in table A. The determination of the normal cost contribution follows in table B. The determination of the annual required contribution appears in table C.

Actuarial balance sheet

As discussed in section 3 the actuarial balance sheet is a measure of the financial condition of the system and shows the relationship between "actuarial assets" and "actuarial liabilities." The actuarial balance sheet is presented in table D.

Table A

Determination of the Unfunded Frozen Actuarial Accrued Liability

1.	Unfunded frozen actuarial accrued liability as of January 1, 2009	$136,040,308
2.	Normal cost due January 1, 2009	6,451,014
3.	Interest on (1) and (2) at 8.0% to December 31, 2009	11,399,306
4.	Employer contributions for 2009	28,598,502
5.	Interest on (4) at 8.0% to December 31, 2009	0
6.	Supplement for changes in actuarial assumptions or benefits	0
7.	Unfunded frozen actuarial accrued liability as of January 1, 2010, (1) + (2) + (3) − (4) − (5) + (6)	125,292,126
8.	Actuarial accrued liability contribution for 2010	11,590,415

Table B

Determination of Normal Cost Contribution

1. Actuarial present value of future benefits

   a. Active participants

i. Retirement benefits	$408,414,180	
ii. Vested withdrawal benefits	24,044,215	
iii. Refund of contributions	3,104,091	
iv. Survivor benefits	13,541,782	
v. Disability benefits	14,523,960	
Total		$ 463,628,228

   b. Retired participants and beneficiaries   768,168,279

   c. Inactive participants

i. Participants on leave of absence without pay	5,770,229	
ii. Terminated participants	31,892,784	
Total		37,663,013

   d. Total actuarial present value of future benefits $1,269,459,520

2. Unfunded frozen actuarial accrued liability as of January 1, 2010   125,292,126

3. Actuarial value of assets as of December 31, 2009   950,709,944

4. Actuarial present value of future participant contributions   98,168,720

5. Actuarial present value of future employer normal costs, (1)(d) – (2) – (3) – (4), not less than $0   95,288,730

6. Actuarial present value of future covered compensation of current participants   1,963,374,397

7. Employer normal cost rate, (5) / (6)   4.85%

8. Total covered compensation   241,958,133

9. Normal cost due January 1, 2010, (7) x (8)   11,734,969

10. Normal cost contribution due by December 31, 2010, (9) adjusted for interest at 8%   12,673,767

Table C

Required Annual Contribution

	Board of education	Retirement system	Charter schools	Total
Normal cost contribution	$ 10,411,884	$ 30,276	$ 2,231,607	$ 12,673,767
Actuarial accrued liability contribution	9,521,877	27,688	2,040,850	$ 11,590,415
Annual required contribution (ARC)	19,933,761	57,964	4,272,457	$ 24,264,182
Covered compensation	198,775,945	578,006	42,604,182	$241,958,133
ARC as % of covered compensation	10.03%	10.03%	10.03%	10.03%

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Table C

Table D

Actuarial Balance Sheet as of January 1, 2010

Actuarial assets

Actuarial value of present assets		$ 950,709,944
Actuarial present value of future participant contributions		98,168,720
Actuarial present value of future employer contributions for:		
Normal costs		95,288,730
Actuarial accrued liability		125,292,126
Total present and future assets		$1,269,459,520

Actuarial liabilities

Actuarial present value of benefits now payable		$ 768,168,279
Actuarial present value of benefits payable in the future:		
Active participants – new plan	$461,600,944	
Active participants – old plan	2,027,284	
Participants on leave of absence without pay	5,770,229	
Terminated participants	31,892,784	
Total payable in the future		501,291,241
Total liabilities for benefits		$1,269,459,520
Surplus / (deficit)		$ 0

Tables E and F

Projected Benefit Obligation Funding Ratios

The funding objective of the retirement system is to meet long-term benefit promises through contributions that remain approximately level from year to year as a percentage of covered compensation. If the contributions are level in concept and realistically determined, the system will pay all benefits when due — the ultimate test of financial soundness.

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 benefit obligation cost method. Under this method, liabilities are determined for each participant based on service and already rendered, but also anticipates the impact of future salary growth on the benefits attributable to current active participants.

Table E 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. Table F 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 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 service already rendered.

In a system that has been following an appropriate and disciplined funding policy, 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. Ideally, Liabilities 2 and 3 will be 100% funded since those liabilities are associated with participants who are no longer active. However, under many reasonable funding methods, Liability 3 may not become fully funded despite the appropriate funding discipline. Additionally, 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.

Table E

Projected Benefit Obligation Funded Status

As of January 1, 2010 the projected benefit obligation was:

1.	Retired members and beneficiaries currently receiving benefits and terminated members not yet receiving benefits	$ 805,831,292
	a. Current active participants	
	i. Accumulated member contributions, including interest	110,054,510
	ii. Employer-financed vested benefits	177,678,571
	iii. Employer-financed non-vested benefits	17,506,580
	Total projected benefit obligation	$1,111,070,953

As of January 1, 2010 the projected benefit obligation was funded as follows:

2.	Net assets available for benefits at actuarial value	$ 950,709,944
3.	Unfunded projected benefit obligation	160,361,009
4.	Actuarial value funding ratio, (2) / (1)	85.6%
5.	Net assets available for benefits at market value	$ 861,659,811
6.	Unfunded projected benefit obligation	249,411,142
7.	Market value funding ratio, (5) / (1)	77.6%

Table F

Prioritized Solvency Test

Valuation date January 1	Active participants' accumulated contributions	Inactive participants and beneficiaries	Participants (employer-financed)	Actuarial value of assets	Percent of present value covered by valuation assets		
	(1)	(2)	(3)		(1)	(2)	(3)
1997	118,041,749	272,393,748	251,827,653	598,638,356	100%	100%	83%
1998	122,227,173	296,455,647	252,445,749	644,429,672	100%	100%	89%
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%

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Table G

Information for Accounting Purposes

The following information is required to satisfy the reporting requirements of the Governmental Accounting Standards Board Statement No. 25 on Financial Reporting for Deferred Benefit Plans.

Actuarial valuation date	Actuarial value of assets	Actuarial accrued liability	Unfunded actuarial accrued liability (UAAL)	Funded ratio	Covered payroll	UAAL as a % of payroll
	(a)	(b)	(b) – (a)	(a) / (b)	(c)	((b) – (a)) / (c)
1/1/1992	$427,706,455	$501,997,792	$74,291,337	85.2%	$194,190,353	38.3%
1/1/1993	458,279,727	530,766,832	$72,487,105	86.3%	194,555,489	37.3%
1/1/1994	487,385,302	557,941,103	70,555,801	87.4%	202,384,485	34.9%
1/1/1995	519,088,399	588,157,615	69,069,216	88.3%	207,113,839	33.3%
1/1/1996	562,177,274	664,807,425	102,630,151	84.6%	206,935,682	49.6%
1/1/1997	598,638,356	716,727,527	118,089,171	83.5%	210,228,288	56.2%
1/1/1998	644,429,672	759,687,878	115,258,206	84.8%	210,843,186	54.7%
1/1/1999	694,250,672	846,891,006	152,640,334	82.0%	215,602,351	70.8%
1/1/2000	770,090,498	937,669,100	167,578,602	82.1%	216,699,483	77.3%
1/1/2001	828,097,298	1,022,042,819	193,945,521	81.0%	235,087,151	82.5%
1/1/2002	861,128,076	1,069,789,813	208,661,737	80.5%	243,880,038	85.6%
1/1/2003	873,260,102	1,063,209,205	189,949,103	82.1%	283,935,810	66.9%
1/1/2004	901,996,455	1,074,259,628	172,263,173	84.0%	255,317,974	67.5%
1/1/2005	935,328,638	1,084,409,302	149,080,664	86.3%	240,185,055	62.1%
1/1/2006	983,828,243	1,122,583,775	138,755,532	87.6%	227,035,801	61.1%
1/1/2007	1,003,428,983	1,150,263,339	146,834,356	87.2%	222,387,289	66.0%
1/1/2008	1,014,923,381	1,158,921,113	143,997,732	87.6%	225,190,968	63.9%
1/1/2009	963,851,408	1,099,891,716	136,040,308	87.6%	234,582,326	58.0%
1/1/2010	950,709,944	1,076,002,070	125,292,126	88.4%	241,958,133	51.8%

Year ended 12/31	Annual required contribution	Percentage contributed
1993	$14,098,562	98.4%
1994	15,441,488	99.2%
1995	15,087,519	99.6%
1996	16,619,187	100.1%
1997	16,876,759	100.2%
1998	15,328,067	111.1%
1999	13,906,270	124.5%
2000	15,543,984	112.3%
2001	18,168,580	100.2%
2002	19,076,442	100.6%
2003	19,517,288	101.2%
2004	19,210,506	132.0%
2005	19,364,705	121.4%
2006	14,414,133	114.9%
2007	17,311,658	129.7%
2008	21,021,316	132.5%
2009	21,406,949	133.6%
2010	19,407,722	*
2011	24,264,182	*

* To be determined at the end of the year.

Section 5

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 section 3 and the development of the actuarial value of assets is shown in table H. An important element in the development of the actuarial value of assets is the expense and contingency reserve (called the expense fund prior to 1988). 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 table I.

As shown in table J, the fund had a rate of return of 5.49% on an actuarial value basis, which is 2.51% below the assumed rate of return of 8.00% for 2009. Normally, in accordance with Rule X, amounts would have been transferred from the investment contingency portion of the reserve, because the preliminary actuarial rate of return would have been less than the assumed rate of return by more than 1%. However, the contingency reserve was exhausted at January 1, 2009, so no additional amounts are available.

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 of 18.79%, also presented in table J.

Table H

Development of the Actuarial Value of Assets

1.	Actuarial value of assets as of January 1, 2009	$ 963,948,861
2.	Participant contributions	12,131,979
3.	Employer contributions	28,598,502
4.	Benefit payments and expenses	105,103,897
5.	Investment increment at 8.0%, 8% x {(1) + .5 x [(2) – (4)]}	73,397,032
6.	Expected actuarial value on January 1, 2010, (1) + (2) + (3) – (4) + (5)	972,972,477
7.	Market value of assets on January 1, 2010	891,562,918
8.	Expense and contingency reserve on January 1, 2010, prior to adjustment	29,903,107
9.	Adjustment to the investment contingency reserve	0
10.	Excess of market value over expected actuarial value, (7) – (6) – (8) – (9)	(111,312,666)
11.	Market value adjustment, 20% x (10)	(22,262,533)
12.	Actuarial value of assets as of January 1, 2010, (6) + (11)	950,709,944

Table I

The Expense and Contingency Reserve

Effective January 1, 1996, the Board of Trustees revised Rule XI, 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 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.

Since the actuarial return on assets was less than 7% during 2009, a portion of the reserve would normally be released. However, since the entire contingency reserve was released last year, nothing further is available to be released.

Below is a history of the expense and contingency reserve:

January 1	Expense reserve	Investment contingency reserve	Total expense and contingency reserve
1996	$33,702,346	$ 0	$33,702,346
1997	25,403,190	5,220,821	30,624,011
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

Table J

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, 2009	$809,792,984
ii.	B = Market value of assets as of January 1, 2010	891,562,918
iii.	C = Contributions during the period	40,730,481
iv.	D = Disbursements during the period	105,103,897
v.	Rate of return: $\dfrac{B - A + D - C}{A + \frac{1}{2}(C - D)}$	18.79%
vi.	Actuarial assumed rate of return for 2009	8.00%
vii.	Difference between actual and assumed rates of return, (v) − (vii)	10.79%

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, 2009	$963,948,861
ii.	B = Actuarial value of assets as of January 1, 2010	950,709,944
iii.	C = Contributions during the period	40,730,481
iv.	D = Disbursements during the period	105,103,897
v.	Rate of return: $\dfrac{B - A + D - C}{A + \frac{1}{2}(C - D)}$	5.49%
vi.	Actuarial assumed rate of return for 2009	8.00%
vii.	Difference between actual and assumed rates of return, (v) − (vii)	-2.51%

Section 6

Exhibits and Appendix

Exhibit A

Outline of Provisions of Current Law

Participants

All persons regularly employed by the board of education and employees of the board of trustees are in the system. A few employees elected to remain out of system when it started January 1, 1944. Some participants elected to remain under old law as of October 13, 1961.

Board of trustees

The board consists of eleven members. Four members are appointed by board of education, three teacher members (two active and one retired), three non-teacher members (two active and one retired) and one active member who is a school administrator are elected by participants of system.

Retirement age

a. Normal - Age 65 or any age if age plus the years of credited service equals or exceeds 85 (Rule of 85)
b. Early - Age 60 with 5 years of service

Service retirement allowance

a. 2% (1-1/4% if terminated prior to July 1, 1999) 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 85 would be satisfied, if earlier. For example, the age 60 factor is 66.67% and the age 62 factor is 80% for a participant who cannot satisfy the Rule of 85 before age 65.

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 subject to routine verification.

Withdrawal benefit

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

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.

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

Contributions by employers

As needed to keep system actuarially sound.

Expenses

Administration expenses paid out of investment income.

Exhibit B

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.

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.

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

employed as "special school advisors and supervisors" at a "salary" of $250 per month less their retirement benefits.

- Retired participants who retired prior to January 1, 1976, may be employed as "school 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.

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.

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 compensation 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 compensation 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.

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.

Exhibit C

Non-Disabled Life Mortality Rates

	Death rate			Death rate	
Male	**Age**	**Female**	**Male**	**Age**	**Female**
.000345	20	.000191	.012737	65	.009706
.000357	21	.000192	.014409	66	.010954
.000366	22	.000194	.016075	67	.012163
.000373	23	.000197	.017871	68	.013445
.000376	24	.000201	.019802	69	.014860
.000376	25	.000207	.022206	70	.016742
.000378	26	.000214	.024570	71	.018579
.000382	27	.000223	.027281	72	.020665
.000393	28	.000235	.030387	73	.022970
.000412	29	.000248	.033900	74	.025458
.000444	30	.000264	.037834	75	.028106
.000499	31	.000307	.042169	76	.030966
.000562	32	.000350	.046906	77	.034105
.000631	33	.000394	.052123	78	.037595
.000702	34	.000435	.057927	79	.041506
.000773	35	.000475	.064368	80	.045879
.000841	36	.000514	.072041	81	.050780
.000904	37	.000554	.080486	82	.056294
.000964	38	.000598	.089718	83	.062506
.001021	39	.000648	.099779	84	.069517
.001079	40	.000706	.110757	85	.077446
.001142	41	.000774	.122797	86	.086376
.001215	42	.000852	.136043	87	.096337
.001299	43	.000937	.150590	88	.107303
.001397	44	.001029	.166420	89	.119154
.001508	45	.001124	.183408	90	.131682
.001616	46	.001223	.199769	91	.144604
.001734	47	.001326	.216605	92	.157618
.001860	48	.001434	.233662	93	.170433
.001995	49	.001550	.250693	94	.182799
.002138	50	.001679	.267491	95	.194509
.002449	51	.001852	.283905	96	.205379
.002667	52	.002018	.299852	97	.215240
.002916	53	.002207	.315296	98	.223947
.003196	54	.002424	.330207	99	.231387
.003624	55	.002717	.344556	100	.237467
.004200	56	.003090	.358628	101	.244834
.004693	57	.003478	.371685	102	.254498
.005273	58	.003923	.353040	103	.266044
.005945	59	.004441	.392003	104	.279055
.006747	60	.005055	.397886	105	.293116
.007676	61	.005814	.400000	106	.307811
.008757	62	.006657	.400000	107	.322725
.010012	63	.007648	.400000	108	.337441
.011280	64	.008619	.400000	109	.351544
400000	110	.364617	.400000	115	.400000
.400000	111	.376246	.400000	116	.400000
.400000	112	.386015	.400000	117	.400000
.400000	113	.393507	.400000	118	.400000
.400000	114	.398308	.400000	119	.400000

Exhibit C

Exhibit D

Disabled Life Mortality Rates

	Death rate			Death rate	
Male	**Age**	**Female**	**Male**	**Age**	**Female**
.000773	30	.000475	.064368	75	.045879
.000841	31	.000514	.072041	76	.050780
.000904	32	.000554	.080486	77	.056294
.000964	33	.000598	.089718	78	.062506
.001021	34	.000648	.099779	79	.069517
.001079	35	.000706	.110757	80	.077446
.001142	36	.000774	.122797	81	.086376
.001215	37	.000852	.136043	82	.096337
.001299	38	.000937	.150590	83	.107303
.001397	39	.001029	.166420	84	.119154
.001508	40	.001124	.183408	85	.131682
.001616	41	.001223	.199769	86	.144604
.001734	42	.001326	.216605	87	.157618
.001860	43	.001434	.233662	88	.170433
.001995	44	.001550	.250693	89	.182799
.002138	45	.001679	.267491	90	.194509
.002449	46	.001852	.283905	91	.205379
.002667	47	.002018	.299852	92	.215240
.002916	48	.002207	.315296	93	.223947
.003196	49	.002424	.330207	94	.231387
.003624	50	.002717	.344556	95	.237467
.004200	51	.003090	.358628	96	.244834
.004693	52	.003478	.371685	97	.254498
.005273	53	.003923	.353040	98	.266044
.005945	54	.004441	.392003	99	.279055
.006747	55	.005055	.397886	100	.293116
.007676	56	.005814	.400000	101	.307811
.008757	57	.006657	.400000	102	.322725
.010012	58	.007648	.400000	103	.337441
.011280	59	.008619	.400000	104	.351544
.012737	60	.009706	.397886	105	.364617
.014409	61	.010954	.400000	106	.376246
.016075	62	.012163	.400000	107	.386015
.017871	63	.013445	.400000	108	.393507
.019802	64	.014860	.400000	109	.398308
.022206	65	.016742	.400000	110	.400000
.024570	66	.018579	.400000	111	.400000
.027281	67	.020665	.400000	112	.400000
.030387	68	.022970	.400000	113	.400000
.033900	69	.025458	.400000	114	.400000
.037834	70	.028106	1.000000	115	1.000000
.042169	71	.030966			
.046906	72	.034105			
.052123	73	.037595			
.057927	74	.041506			

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Exhibit E

Active Participant Rates of Decrement

Attained age	Withdrawal rate		Disability rate		Retirement rate
	Males	Females	Males	Females	
20	15.00%	15.00%	.000%	.000%	0.0%
21	14.50%	14.50%	.000%	.000%	0.0%
22	14.00%	14.00%	.000%	.000%	0.0%
23	13.50%	13.50%	.000%	.000%	0.0%
24	13.00%	13.00%	.000%	.000%	0.0%
25	12.50%	12.50%	.000%	.000%	0.0%
26	12.00%	12.00%	.000%	.000%	0.0%
27	11.50%	11.50%	.000%	.000%	0.0%
28	11.00%	11.00%	.000%	.000%	0.0%
29	9.50%	9.50%	.000%	.000%	0.0%
30	9.00%	9.00%	.040%	.040%	0.0%
31	8.80%	8.80%	.040%	.040%	0.0%
32	8.40%	8.40%	.040%	.040%	0.0%
33	7.90%	7.90%	.040%	.040%	0.0%
34	7.50%	7.50%	.040%	.040%	0.0%
35	7.00%	7.00%	.040%	.040%	0.0%
36	6.80%	6.80%	.045%	.045%	0.0%
37	6.60%	6.60%	.050%	.050%	0.0%
38	6.40%	6.40%	.060%	.060%	0.0%
39	6.20%	6.20%	.070%	.070%	0.0%
40	6.00%	6.00%	.080%	.075%	0.0%
41	5.40%	5.40%	.095%	.080%	0.0%
42	4.80%	4.80%	.110%	.085%	0.0%
43	4.20%	4.20%	.125%	.090%	0.0%
44	3.60%	3.60%	.140%	.095%	0.0%
45	3.00%	3.00%	.150%	.100%	0.0%
46	2.80%	2.80%	.160%	.110%	0.0%
47	2.60%	2.60%	.170%	.120%	0.0%
48	2.40%	2.40%	.180%	.130%	0.0%
49	2.20%	2.20%	.190%	.140%	0.0%
50	2.00%	2.00%	.200%	.150%	0.0%
51	1.90%	1.90%	.250%	.170%	0.0%
52	1.80%	1.80%	.300%	.190%	0.0%
53	1.70%	1.70%	.350%	.210%	0.0%
54	1.60%	1.60%	.400%	.230%	0.0%

Exhibit E

Active Participant Rates of Decrement
(Continued)

Attained age	Withdrawal rate		Disability rate		Retirement rate
	Males	Females	Males	Females	
55	1.50%	1.50%	.450%	.250%	5.0%
56	1.40%	1.40%	.470%	.260%	5.0%
57	1.30%	1.30%	.490%	.275%	5.0%
58	1.20%	1.20%	.510%	.285%	5.0%
59	1.10%	1.10%	.530%	.300%	7.5%
60	1.00%	1.00%	.550%	.325%	7.5%
61	0.00%	0.00%	.600%	.350%	12.5%
62	0.00%	0.00%	.650%	.350%	25.0%
63	0.00%	0.00%	.700%	.350%	17.5%
64	0.00%	0.00%	.750%	.350%	25.0%
65	0.00%	0.00%	.000%	.000%	35.0%
66	0.00%	0.00%	.000%	.000%	20.0%
67	0.00%	0.00%	.000%	.000%	20.0%
68	0.00%	0.00%	.000%	.000%	20.0%
69	0.00%	0.00%	.000%	.000%	25.0%
70	0.00%	0.00%	.000%	.000%	100.0%

Exhibit F

Family Structure

Age Male	Age Female	Age of youngest child	Average number of children	Probability of being married	Probability of children if married
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

Exhibit F

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

Exhibit G

Membership as of January 1, 2010

	Males	Females	Total
Active participants			
New plan	906	2,760	3,666
Age over 70	5	13	18
Charter school	303	829	1,132
Retired officer	5	4	9
Total active participants	1,219	3,606	4,825
Inactive participants (terminated or leave of absence without pay)			
Terminated	586	1,180	1,766
Leave of absence without pay	59	71	130
Total participants not retired	645	1,251	1,896
Retired participants and beneficiaries			
Retired participants and contingent annuitants	1,028	2,786	3,814
Survivors	51	235	286
Disabled participants	73	197	270
Benefit depleted	37	11	148
Total retired participants and beneficiaries	1,189	3,329	4,518
Total membership	3,053	8,186	11,239

Exhibit H

Retired Participants and Beneficiaries as of January 1, 2010

Option	Service benefit	Disability benefit	Survivor benefit	All
0	3,227	225	286	3,738
1	147	15	0	162
2	88	4	0	92
3	170	13	0	183
4	159	5	0	164
5	13	4	0	17
6	9	4	0	13
7	1	0	0	1
Total	3,814	270	286	4,370

	Annual benefit			
Option	Service benefit	Disability benefit	Survivor benefit	All
0	$73,517,064	$2,593,692	$2,798,232	$78,908,988
1	2,677,716	197,772	0	2,875,488
2	1,936,104	70,524	0	2,006,628
3	3,363,864	127,320	0	3,491,184
4	3,883,212	97,416	0	3,980,628
5	336,076	29,485	0	365,561
6	197,196	21,275	0	218,471
7	44,580	0	0	44,580
Total	$85,955,812	$3,137,484	$2,798,232	$91,891,528

Appendix

Definitions 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 also includes the eligibility provisions, factors and optional forms of payment associated with it.

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. The present value of accumulated plan benefits as of the valuation date is determined for purposes of financial reporting.

Actuarial accrued liability
Equal to the actuarial present value of future benefits less the present value of future annual normal costs. (See annual normal cost.)

Actuarial assumptions
The bases for estimates of future events affecting pension costs. These assumptions include projections of mortality, withdrawals, disability, ages at retirement, rates of investment earnings, plan expenses and other relevant factors.

Actuarial cost method
The method for allocating the actuarial present value of a pension plan's benefits and expenses to various time periods. The annual cost under an actuarial cost method is usually in the form of an annual normal cost plus an amortization of an actuarial accrued liability. 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. It is determined in accordance with a particular actuarial cost method for the period between two actuarial valuation dates. 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.

Actuarial gains/(losses) are also 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.

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.

Annual 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. The annual normal cost may differ depending upon the actuarial cost method used.

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.

Future service
Service with the employer after the valuation date.

Member
See participant.

Normal retirement age
An age defined in the plan for purposes of establishing when benefits must be paid and the amount of benefit that is to be treated as nonforfeitable.

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 (through discounts for investment yield) and the probabilities of payment (taking into account death, disability, withdrawal and age at retirement).

Rate of return
The actual or expected investment income (including interest, dividends, realized gains/(losses) and unrealized appreciation/(depreciation)) as a percentage of a plan's average assets. The rate can be measured on various bases--for example, an actuarial rate based on the actuarial value of assets, a market rate based on the market value of assets, etc.

Unfunded
Means not provided by the value of assets.

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

Valuation
See actuarial valuation.

Valuation date
The date as of which the actuarial status of the plan is determined.

Vested benefit
A benefit that is not forfeited if the participant has a permanent break in service.