

Summary of Actuarial Assumptions and Methods

as of January 1, 2016



- a)** The actuarial valuation was prepared using the entry age actuarial cost method. As described in the certification letter, the contribution rates are set based on the board's funding policy, which states the contribution rate will not be less than the amount needed to amortize the unfunded actuarial accrued liability of each System over a 20-year period from the valuation date (January 1, 2015).

In calculating this minimum, amortization payments are designed to remain level as a percent of payroll, and payroll is assumed to increase 3.10% per year. Under this method, actuarial gains and losses are identified and amortized as part of the unfunded actuarial accrued liability over a period that does not exceed 20 years.

- b)** The future investment earnings of the assets of the Systems are assumed to accrue at an annual rate of 7.20%, compounded annually. This rate is made up of a 2.60% assumed inflation rate and a 4.60% assumed real rate of return. This assumption was adopted January 1, 2016.

- c)** The total rates of assumed annual salary increase are shown on the actuarial schedule on page 153. The rates include increases due to promotion and longevity and a 3.35% per annum rate of increase in the general wage level of the membership. Salaries of judges are assumed to increase at 3.35%. All of these assumptions were adopted January 1, 2016.

- d)** Post-retirement benefit increases are based on the consumer price index (CPI), limited by the provisions of each System. For members of the Public Safety Retirement System, annual increases are assumed to be 2.5% or 2.60%. All other Systems' annual increases are assumed to be 2.60%. Increases are based on the member's original retirement allowance except in the Judges Retirement System where increases are compounded. For current retirees who have received cumulative COLAs less than the total of annual CPI increases since retirement, higher COLAs are assumed, subject to the annual maximum (2.5% or 4% for Public Safety and 4% for all other Systems), as long as the member has "banked" CPI increases left.

Summary of Actuarial Assumptions and Methods *(Continued)*

as of January 1, 2016

Retired Member Mortality

Class of Member

Educators

Men	EDUM (90%)
Women	EDUF (100%)

Public Safety and Firefighters

Men	RP 2000mWC (100%)
Women	EDUF (120%)

Local Government, Public Employees

Men	RP 2000mWC (100%)
Women	EDUF (120%)

EDUM = Constructed mortality table based on actual experience of male educators multiplied by given percentage

EDUF = Constructed mortality table based on actual experience of female educators multiplied by given percentage

RP 2000mWC = RP 2000 Combined mortality table for males with white collar adjustments multiplied by given percentage

e) Tables of mortality rates for male members retired for service and beneficiaries (except educators) were developed from a standard mortality table. Mortality rates for male retired educators were developed from actual experience of that group. Mortality rates for female members retired for service and beneficiaries were developed from actual experience of the female educators. The mortality basis is dependent upon the member's class and gender as shown above. These base rates are adjusted for future improvement in mortality using published Scale AA projected from the year 2000. With the exception of the female educators, these rates were adopted January 1, 2011, the female educators assumptions was adopted January 1, 2014. Mortality rates for active members use the RP 2000 employees mortality tables as the underlying assumption with scaling factors applied based on employee group and gender. The assumptions were adopted effective January 1, 2014.

f) Mortality among disabled members is based on a special 1981 Disability Table developed from the Systems' experience. The rates for males and females are also adjusted for future improvement in mortality using published Scale AA projected from the year 2000.

g) Other demographic assumptions regarding retirement, mortality, disablement, and termination from employment are illustrated in the following actuarial schedules.

The retirement assumptions illustrated are for members of the Systems who are eligible to retire with 30 years of service (35 years of service for Tier 2). For public employees the rates vary by age and eligibility for reduced or unreduced retirement. For Public Safety, Firefighters, and Judges the rates vary by age and service groupings.

Rates of assumed termination from employment are assumed to vary by years of service. All terminating members who are not eligible for vested benefits are assumed to withdraw their contributions immediately. Vested members are assumed to withdraw their contributions and forfeit the right to further benefits at the rates illustrated.

h) The Retirement Board uses the expected rate of return method for calculating the actuarial value of assets. This method is based on the total earnings of the commingled investments and spreads the excess/shortfall of actual investment returns over or under the expected return over five years. One-fifth of the excess/shortfall is recognized each year. The actuarial values of assets under this method were calculated and reported to us by the Systems' staff.

i) All of the actuarial assumptions were renewed or adopted by the Retirement Board in 2014, as recommended by the actuary. The assumptions for Tier 2 members are the same as the Tier 1 members, except for retirement rates.

Summary of Actuarial Assumptions and Methods (Continued)

as of January 1, 2016

		Percent Retiring Within Next Year Among Active Members Eligible for Retirement							Governors and Legislators Retirement Plan
		Male			Female				
Retirement Age	State and School Division	Local Government Division		State and School Division		Local Government Division			
		Educators	Public Employees	Educators	Public Employees				
Tier 1 Noncontributory and Contributory Retirement Systems <i>Adopted January 1, 2014</i>	50	20.00%	15.00%	15.00%	30.00%	17.00%	20.00%	0.00%	
	51	20.00	15.00	15.00	30.00	16.00	20.00	0.00	
	52	20.00	15.00	15.00	30.00	16.00	20.00	0.00	
	53	20.00	15.00	15.00	14.00	16.00	20.00	0.00	
	54	12.00	15.00	15.00	14.00	16.00	20.00	0.00	
	55	12.00	16.00	15.00	14.00	16.00	25.00	0.00	
	56	12.00	16.00	15.00	18.00	16.00	25.00	0.00	
	57	12.00	16.00	15.00	18.00	16.00	25.00	0.00	
	58	12.00	16.00	15.00	18.00	20.00	25.00	0.00	
	59	12.00	16.00	15.00	18.00	20.00	25.00	0.00	
	60	23.00	20.00	20.00	30.00	30.00	30.00	0.00	
	61	23.00	20.00	20.00	30.00	30.00	30.00	0.00	
	62	30.00	33.00	23.00	35.00	30.00	30.00	100.00	
	63	30.00	33.00	23.00	35.00	30.00	30.00	100.00	
	64	30.00	30.00	23.00	30.00	30.00	30.00	100.00	
	65	30.00	22.00	23.00	30.00	26.00	25.00	100.00	
	66	30.00	22.00	30.00	30.00	26.00	25.00	100.00	
	67	30.00	22.00	22.00	30.00	22.00	25.00	100.00	
	68	30.00	22.00	22.00	23.00	22.00	25.00	100.00	
	69	25.00	22.00	22.00	23.00	22.00	25.00	100.00	
	70	20.00	22.00	22.00	23.00	22.00	20.00	100.00	
	71	20.00	22.00	18.00	23.00	22.00	15.00	100.00	
	72	20.00	22.00	18.00	23.00	22.00	15.00	100.00	
	73	20.00	22.00	18.00	23.00	22.00	15.00	100.00	
	74	20.00	22.00	18.00	23.00	22.00	15.00	100.00	
	75	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

		Percent Retiring Within Next Year Among Active Members Eligible for Retirement										
		Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	
Tier 1 Public Safety Retirement System <i>Adopted January 1, 2014</i>	45	20.00%	50	20.00%	55	20.00%	59	20.00%	63	35.00%	67	50.00%
	46	20.00	51	20.00	56	20.00	60	20.00	64	35.00	68	50.00
	47	20.00	52	20.00	57	20.00	61	20.00	65	50.00	69	50.00
	48	20.00	53	20.00	58	20.00	62	35.00	66	50.00	70	100.00
	49	20.00	54	20.00								

		Percent Retiring Within Next Year Among Active Members Eligible for Retirement										
		Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	
Tier 1 Firefighters Retirement System <i>Adopted January 1, 2014</i>	45	15.00%	50	15.00%	55	20.00%	59	20.00%	63	25.00%	67	50.00%
	46	15.00	51	15.00	56	20.00	60	22.50	64	25.00	68	50.00
	47	15.00	52	15.00	57	20.00	61	22.50	65	50.00	69	50.00
	48	15.00	53	15.00	58	20.00	62	25.00	66	50.00	70	100.00
	49	15.00	54	15.00								

		Percent Retiring Within Next Year Among Active Members Eligible for Retirement										
		Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	
Judges Retirement System <i>Adopted January 1, 2014</i>	45	10.00%	50	10.00%	55	10.00%	59	10.00%	63	20.00%	67	20.00%
	46	10.00	51	10.00	56	10.00	60	10.00	64	20.00	68	20.00
	47	10.00	52	10.00	57	10.00	61	10.00	65	20.00	69	20.00
	48	10.00	53	10.00	58	10.00	62	20.00	66	20.00	70	100.00
	49	10.00	54	10.00								

Summary of Actuarial Assumptions and Methods (Continued)

as of January 1, 2016

		Percent Retiring Within Next Year Among Active Members Eligible for Retirement							Governors and Legislators Retirement Plan
		Male			Female				
Retirement Age	State and School Division	Public Employees		Local Government Division	Public Employees		Local Government Division		
		Educators			Educators				
Tier 2	50	20.00%	15.00%	15.00%	30.00%	17.00%	20.00%	0.00%	
Public Employees Retirement System	51	20.00	15.00	15.00	30.00	16.00	20.00	0.00	
<i>Adopted January 1, 2014</i>	52	20.00	15.00	15.00	30.00	16.00	20.00	0.00	
	53	20.00	15.00	15.00	14.00	16.00	20.00	0.00	
	54	12.00	15.00	15.00	14.00	16.00	20.00	0.00	
	55	12.00	16.00	15.00	14.00	16.00	25.00	0.00	
	56	12.00	16.00	15.00	18.00	16.00	25.00	0.00	
	57	12.00	16.00	15.00	18.00	16.00	25.00	0.00	
	58	12.00	16.00	15.00	18.00	20.00	25.00	0.00	
	59	12.00	16.00	15.00	18.00	20.00	25.00	0.00	
	60	23.00	20.00	20.00	30.00	30.00	30.00	0.00	
	61	23.00	20.00	20.00	30.00	30.00	30.00	0.00	
	62	30.00	33.00	23.00	35.00	30.00	30.00	100.00	
	63	30.00	33.00	23.00	35.00	30.00	30.00	100.00	
	64	30.00	30.00	23.00	30.00	30.00	30.00	100.00	
	65	30.00	22.00	23.00	30.00	26.00	25.00	100.00	
	66	30.00	22.00	30.00	30.00	26.00	25.00	100.00	
	67	30.00	22.00	22.00	30.00	22.00	25.00	100.00	
	68	30.00	22.00	22.00	23.00	22.00	25.00	100.00	
	69	25.00	22.00	22.00	23.00	22.00	25.00	100.00	
	70	20.00	22.00	22.00	23.00	22.00	20.00	100.00	
	71	20.00	22.00	18.00	23.00	22.00	15.00	100.00	
	72	20.00	22.00	18.00	23.00	22.00	15.00	100.00	
	73	20.00	22.00	18.00	23.00	22.00	15.00	100.00	
	74	20.00	22.00	18.00	23.00	22.00	15.00	100.00	
	75	100.00	100.00	100.00	100.00	100.00	100.00	100.00	

Retirement rates at the age the member is first eligible for an unreduced retirement benefit prior to age 65 is increased by 30%.

		Percent Retiring Within Next Year Among Active Members Eligible for Retirement										
Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age		
											Tier 2	45
Public Safety and Firefighter Retirement System	46	12.00	51	12.00	56	12.00	60	25.00	64	35.00	68	50.00
Public Safety	47	12.00	52	12.00	57	12.00	61	30.00	65	50.00	69	50.00
<i>Adopted January 1, 2014</i>	48	12.00	53	12.00	58	12.00	62	35.00	66	50.00	70	100.00
	49	12.00	54	12.00								

		Percent Retiring Within Next Year Among Active Members Eligible for Retirement										
Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age	Retirement Age		
											Firefighters	45
<i>Adopted January 1, 2014</i>	46	9.00	51	9.00	56	12.00	60	40.00	64	40.00	68	60.00
	47	9.00	52	9.00	57	12.00	61	40.00	65	60.00	69	60.00
	48	9.00	53	9.00	58	12.00	62	40.00	66	60.00	70	100.00
	49	9.00	54	9.00								

Summary of Actuarial Assumptions and Methods (Continued)

as of January 1, 2016

	Other Termination of Employment Percent of Active Members Separating Within Next Year							
	Years of Service	Male			Female			Governors and Legislators Retirement Plan
		State and School Division		Local Government Division	State and School Division		Local Government Division	
		Educators	Public Employees		Educators	Public Employees		
Noncontributory and Contributory Retirement Systems <i>Adopted January 1, 2014</i>	0	15.00%	28.00%	19.00%	18.00%	30.00%	24.00%	10.00%
	1	13.00	24.50	15.00	17.00	22.50	18.00	10.00
	2	9.00	15.00	11.00	13.50	17.00	14.00	10.00
	3	7.50	12.00	9.00	12.50	14.00	12.00	10.00
	4	6.50	10.00	8.00	10.00	11.00	11.00	10.00
	5	5.00	9.00	7.00	8.00	9.50	9.75	10.00
	6	4.00	7.50	6.00	7.50	8.50	8.00	10.00
	7	3.50	6.50	5.50	5.50	7.50	7.50	10.00
	8	3.25	5.50	4.75	4.50	6.50	6.50	10.00
	9	3.00	5.00	4.00	4.50	6.00	6.00	10.00
	10	2.75	4.25	3.50	4.00	5.50	5.50	10.00
	11	2.50	4.00	3.25	3.00	4.75	5.00	10.00
	12	2.25	3.75	3.00	2.50	4.50	4.50	10.00
	13	2.25	3.50	3.00	2.00	4.25	4.00	10.00
	14	2.00	3.00	3.00	2.00	3.75	3.75	10.00
	15	1.75	2.50	2.75	2.00	3.50	3.50	10.00
	16	1.75	2.25	2.75	2.00	3.00	3.25	10.00
	17	1.75	2.25	2.75	1.75	2.75	3.25	10.00
	18	1.75	2.00	2.50	1.50	2.75	3.00	10.00
	19	1.50	2.00	2.50	1.25	2.75	2.75	10.00
	20	1.00	2.00	2.00	1.25	2.75	2.50	10.00
	21	1.00	2.00	2.00	1.25	2.50	2.50	10.00
	22	1.00	2.00	1.75	1.25	2.25	2.25	10.00
	23	1.00	1.50	1.50	1.25	2.00	2.00	10.00
	24	1.00	1.50	1.25	1.25	2.00	2.00	10.00
	25+	0.00	0.00	0.00	0.00	0.00	0.00	10.00

	Other Termination of Employment of Active Members Separating Within Next Year									
	Years of Service	Years of Service	Years of Service	Years of Service	Years of Service	Years of Service	Years of Service	Years of Service	Years of Service	Years of Service
Public Safety Retirement System <i>Adopted January 1, 2014</i>	0	12.00%	5	4.50%	9	3.25%	13	2.25%	17	1.50%
	1	6.50	6	4.25	10	3.00	14	1.50	18	1.50
	2	5.50	7	4.00	11	2.75	15	1.50	19	1.50
	3	5.25	8	3.50	12	2.50	16	1.50	20+	0.00
	4	5.00								

	Other Termination of Employment of Active Members Separating Within Next Year									
	Years of Service	Years of Service	Years of Service	Years of Service	Years of Service	Years of Service	Years of Service	Years of Service	Years of Service	Years of Service
Firefighters Retirement System <i>Adopted January 1, 2014</i>	0	6.00%	5	2.00%	9	1.50%	13	0.50%	17	0.50%
	1	3.50	6	1.50	10	1.50	14	0.50	18	0.50
	2	3.00	7	1.50	11	1.50	15	0.50	19	0.50
	3	2.50	8	1.50	12	0.50	16	0.50	20+	0.00
	4	2.50								

Other Termination of Employment of Active Members Separating Within Next Year	
Judges Retirement System <i>Adopted January 1, 1993</i>	None assumed.

Summary of Actuarial Assumptions and Methods (Concluded)

as of January 1, 2016

		Total Annual Increase in Salary (Male and Female)										
		State and School Division					State and School Division					
		Public Employees		Local Government Division	Public Safety Retirement System	Firefighters Retirement System	Public Employees		Local Government Division	Public Safety Retirement System	Firefighters Retirement System	
Years of Service	Years of Service	Educators	Public Employees	Local Government Division	Public Safety Retirement System	Firefighters Retirement System	Years of Service	Educators	Public Employees	Local Government Division	Public Safety Retirement System	Firefighters Retirement System
All Retirement Systems <i>Adopted January 1, 2016</i>	0	10.35%	8.60%	9.10%	7.85%	9.10%	13	4.85%	4.35%	4.35%	4.60%	4.85%
	1	9.35	7.85	7.60	6.85	8.60	14	4.60	4.10	4.35	4.35	4.85
	2	8.35	6.85	6.85	6.60	8.35	15	4.35	3.85	4.35	4.35	4.60
	3	7.85	6.10	6.35	6.35	8.10	16	4.10	3.85	4.10	4.35	4.60
	4	7.60	4.85	5.85	6.10	7.85	17	3.85	3.85	4.10	4.10	4.35
	5	7.35	5.35	5.60	5.85	7.60	18	3.85	3.85	4.10	4.10	4.10
	6	7.35	5.10	5.35	5.85	7.60	19	3.85	3.85	4.10	4.10	4.10
	7	7.10	4.85	5.10	5.60	7.10	20	3.85	3.60	3.85	4.10	4.10
	8	6.85	4.85	4.85	5.35	6.85	21	3.85	3.60	3.60	3.85	3.85
	9	6.60	4.60	4.85	5.35	6.60	22	3.85	3.60	3.60	3.85	3.60
	10	6.10	4.60	4.60	5.10	6.10	23	3.85	3.60	3.35	3.60	3.60
	11	5.60	4.35	4.35	4.85	5.35	24	3.60	3.35	3.35	3.60	3.60
	12	5.35	4.35	4.35	4.60	5.10	25+	3.35	3.35	3.35	3.35	3.35

		Probability of Mortality Within the Next Year for Active Members									
		Male					Female				
		Local Government and Public Employees		Local Government and Public Employees	Local Government and Public Employees	Local Government and Public Employees	Local Government and Public Employees		Local Government and Public Employees	Local Government and Public Employees	Local Government and Public Employees
Age	Age	Educators	Public Employees	Local Government and Public Employees	Local Government and Public Employees	Local Government and Public Employees	Age	Educators	Public Employees	Local Government and Public Employees	Local Government and Public Employees
Noncontributory and Contributory Retirement Systems <i>Adopted January 1, 2014</i>	20	0.0173%	0.0276%	0.0067%	0.0096%	50	0.1069%	0.1710%	0.0587%	0.0838%	
	25	0.0188	0.0301	0.0072	0.0104	55	0.1515	0.2423	0.0884	0.1263	
	30	0.0222	0.0355	0.0092	0.0132	60	0.2439	0.3902	0.1376	0.1966	
	35	0.0387	0.0618	0.0166	0.0238	65	0.3787	0.6058	0.2037	0.2911	
	40	0.0540	0.0863	0.0247	0.0353	70	0.4961	0.7938	0.2665	0.3807	
	45	0.0754	0.1206	0.0393	0.0562						

		Percent Electing a Refund of Contributions Upon Termination While Vested							
		Male				Female			
		Years of Service	Public Employees	Local Government Division	Public Employees	Local Government Division	Public Employees	Local Government Division	
Noncontributory and Contributory Retirement Systems <i>Adopted January 1, 1993</i>	0-3	100%	100%	100%	100%	100%	100%		
	4	75	86	75	65	80	77		
	5	73	83	73	64	79	75		
	10	54	73	61	53	64	61		
	15	33	63	49	32	52	40		
	19	9	29	23	8	22	13		
	20	0	0	0	0	0	0		

		Probability of Mortality Within the Next Year for Active Members Public Safety and Firefighters Employees							
		Age		Age		Age		Age	
Public Safety Retirement System and Firefighters Retirement System <i>Adopted January 1, 2008</i>	20	0.0276%	35	0.0618%	50	0.1710%	65	0.6058%	
	25	0.0301	40	0.0863	55	0.2423	70	0.7938	
	30	0.0355	45	0.1206	60	0.3902			

		Percent Electing a Refund of Contributions Upon Termination While Vested Public Safety and Firefighters Retirement Employees			
		Years of Service		Years of Service	
Public Safety Retirement System and Firefighters Retirement System <i>Adopted January 1, 1993</i>	0-3	100%	15	35%	
	4	76	19	15	
	5	74	20	0	
	10	57			