



**CITY OF LANSING**  
**POLICE AND FIRE RETIREMENT SYSTEM**  
**ACTUARIAL VALUATION**  
**AS OF DECEMBER 31, 2013**

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December, 2014

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December 15, 2014

City of Lansing Police and Fire Retirement System  
124 W. Michigan Avenue  
8th Floor  
Lansing, MI 48933

### ***Executive Summary***

Members of the Board:

The following report sets forth the Actuarial Valuation of the City of Lansing Police and Fire Retirement System as of December 31, 2013. The report is based on participant data and asset summary as of December 31, 2013 as submitted by the Plan Administrator and City finance department. We relied on this information without auditing it.

#### **INVESTMENT PERFORMANCE:**

The total Market Value of Plan Assets for the plan year ending December 31, 2013 was \$319,630,879. Plan assets exclude from this a reserve for healthcare benefits. The total yield of the fund for the plan year ending December 31, 2013 was 17.2% on the market value of assets and 12.6% on an actuarial basis, taking into account asset smoothing.

The Plan uses a smoothing method to determine the City's contributions. Under this method, asset gains or losses are spread over a 5-year period. The gains and losses are determined every year by comparing actual investment returns with expected asset performance. The Board elected to recognize all investment experience prior to 12/31/2012, and maintain 5-year smoothing beginning at 1/1/2013. This strategy maintains a prudent level of unrecognized gains.

Details of the development of the Actuarial Asset Value are shown on page 4.

#### **FUNDING RECOMMENDATIONS:**

The total recommended City contribution for fiscal year 2015 is \$11,050,091. Last year the total recommended contribution was \$11,248,857. The decrease in the contribution is primarily due to investment gains during 2013.

#### **FUNDING PROGRESS:**

The Actuarial Accrued Liability as of December 31, 2013 is \$383,879,280 compared to the Actuarial Value of Assets of \$277,267,947, resulting in a plan funded ratio of 72.2%. Using the market value of assets, this ratio is 77.2%.

The 12/31/2013 actuarial liabilities and fiscal year 2015 contributions reflect changes to assumed return and inflation, adopted by the Board. The return and inflation assumptions were decreased from 7.8% and 3.3% to 7.6% and 3.1%, respectively.

This report has been prepared in accordance with generally accepted actuarial principles and practices. In the opinion of the City and its actuaries, the actuarial assumptions used are reasonably related to Plan experience and expectations.

The undersigned are members of the American Academy of Actuaries, and are qualified to render the actuarial opinions presented in this Report.

The information presented in this report pertains only to the funding of the System. All of the figures related to accounting and disclosure under GASB 67 and 68 are now presented in a separate report.

Respectfully submitted,  
BOOMERSHINE CONSULTING GROUP, L.L.C.

  
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Senior Consultant

  
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Chief Actuary

**TRUST FUND STATEMENT**  
**AND**  
**DETERMINATION OF VALUATION ASSETS**

**TRUST FUND STATEMENT FOR THE PLAN YEAR ENDING  
DECEMBER 31, 2013**

Market Value of Total Fund as of December 31, 2012 \$284,183,964

**Receipts:**

Employer Contributions	11,157,599	
Employer Contributions - Healthcare Reserve	700,000	
Member Contributions	2,704,064	
Adjustments Investment Income		
Interest	4,628,276	
Dividends	1,166,761	
Market Appreciation	42,301,836	
Adjustments (2012 accrual)	135,278	
Total Additions		\$62,793,815

**Disbursements:**

Member Refund	0	
Distributions to Participants/ Beneficiaries, including re	26,270,724	
Administrative Expenses and Other	78,011	
Investment Expenses	998,165	
Total Disbursements		\$27,346,900

Adjustments	0	
Net Increase/(Decrease) in Assets		<u>\$35,446,915</u>

Market Value of Total Fund as of December 31, 2013 \$319,630,879

**ALLOCATION OF NET PLAN ASSETS AS OF DECEMBER 31, 2013**

	<u>Market Value</u>	<u>%</u>
Cash and Short Term Investments	27,470,813	8.6%
Equity	184,876,340	57.7%
Fixed Income	95,118,153	29.8%
Real Estate	16,157,233	5.1%
Accounts payable	<u>(3,991,660)</u>	<u>-1.2%</u>
TOTAL ASSETS	\$319,630,879	100.0%

Estimated Rate of Return on Market Value for 2013: 17.2%

**DETERMINATION OF ACTUARIAL VALUE OF ASSETS AS OF JANUARY 1, 2014**

Market Value of Total Fund as of December 31, 2012			\$284,183,964
Plus: Contributions			14,561,663
Less: Benefit Payments and Refunds			26,270,724
Less: Expenses			78,011
Plus: Expected Return during 2013 (@ 7.8%, prior to assumption change)			21,297,439
Expected Asset Value			\$293,694,331
Market Value of Total Fund as of December 31, 2013			\$319,630,879
Asset Gain/(Loss) for 2013 Plan Year			25,936,548
Market Value of Total Fund as of December 31, 2013			\$319,630,879
Less: 80% of 2013 Gain/(Loss)	80% *	25,936,548	20,749,238
Less: 60% of 2012 Gain/(Loss)	60% *	0 <sup>1</sup>	0
Less: 40% of 2011 Gain/(Loss)	40% *	0 <sup>1</sup>	0
Less: 20% of 2010 Gain/(Loss)	20% *	0 <sup>1</sup>	<u>0</u>
		Total Gain/(Loss) Unrecognized	20,749,238
Actuarial Value of Assets, Total Fund - December 31, 2013			\$298,881,641
as % of Market Value of Assets			93.5%
Healthcare Reserve Fund as of December 31, 2013			\$23,197,213
Adjusted Healthcare Reserve <sup>2</sup>			21,691,704
Actuarial Value of Assets, Pension Plan - December 31, 2013			\$277,189,937

Estimated Rate of Return on the Actuarial Value is 12.6%

<sup>1</sup> 2010 - 2012 Investment Experience fully recognized as of 12/31/2013

<sup>2</sup> Takes into account asset smoothing

**PARTICIPANT SUMMARY**  
**AGE, SERVICE AND COMPENSATION DISTRIBUTION**



**PARTICIPANT SUMMARY AND RECONCILIATION**

	Active Participants	Non-vested Terminations Due Refunds	Deferred Vested Terminations	Retired	Disabled	Beneficiary	Total
Participants as of December 31, 2012	370	15	20	484	61	132	1,082
Retired	(20)	0	(1)	21	0	0	0
Terminated Vested	(4)	0	4	0	0	0	0
Terminated Non-Vested (Member Contributions refunded)	(3)	0	0	0	0	0	(3)
Disabled	(5)	0	0	0	5	0	0
Deceased	(1)	0	0	(10)	(2)	(4)	(17)
New Beneficiary / EDRO	0	0	0	0	0	12	12
Rehired	2	0	0	0	0	0	2
Due Refunds	0	0	0	0	0	0	0
Transfers In from ERS	0	0	0	0	0	0	0
New Hires	13	0	0	0	0	0	13
Data Adjustments	0	0	0	0	0	0	0
Participants as of December 31, 2013	352	15	23	495	64	140	1,089

	12/31/2012			12/31/2013		
	Fire	Police	Total	Fire	Police	Total
<b>Inactive Participants</b>						
Number of Retired Participants	209	275	484	212	283	495
Average Age	65.1	65.3	65.2	65.3	65.4	65.4
Average Annual Benefit	\$46,894	\$41,966	\$44,094	\$47,634	\$43,121	\$45,054
Number of Disabled Participants	37	24	61	39	25	64
Average Age	54.9	51.7	53.6	54.0	52.5	53.4
Average Annual Benefit	\$40,772	\$36,255	\$38,995	\$41,463	\$37,342	\$39,853
Number of Beneficiaries/EDROs	58	74	132	57	83	140
Average Age	75.5	73.0	74.1	76.8	72.1	74.0
Average Annual Benefit	\$14,818	\$15,774	\$15,354	\$15,016	\$16,606	\$15,959
Number of Deferred Vested Participants	3	17	20	4	19	23
Average Age	41.6	48.2	47.3	42.7	47.4	46.6
Average Annual Benefit	\$33,479	\$25,505	\$26,701	\$34,032	\$26,246	\$27,600
Number of Terminated Participants						
Due Refunds	1	14	15	1	14	15

**DISTRIBUTION OF ACTIVE PARTICIPANTS AND AVERAGE COMPENSATION  
BY AGE AND SERVICE AS OF DECEMBER 31, 2013**

Nearest Age	-----Completed Years of Service from Date of Hire-----									Total
	<1	1	2 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	>29	
<20										
20 - 24	7 5,303									7 5,303
25 - 29	4 8,238	3 58,368	2 61,502	8 68,714						17 51,810
30 - 34	1 39,217	4 56,663	4 62,396	25 68,301	16 66,627					50 65,780
35 - 39			4 53,461	13 69,460	36 67,775	16 67,574				69 67,216
40 - 44			2 60,349	5 70,720	14 67,822	62 72,005	9 78,330			92 71,664
45 - 49				4 70,692	6 63,719	22 68,942	38 77,782			70 73,393
50 - 54				1 69,194	3 69,262	11 75,321	24 79,437	1 69,518		40 77,038
55 - 59						3 85,386	2 73,575	1 21,208		6 70,753
60 - 64							1 72,021			1 72,021
>64										
<b>Total</b>	<b>12 9,108</b>	<b>7 57,393</b>	<b>12 58,927</b>	<b>56 69,032</b>	<b>75 67,274</b>	<b>114 71,464</b>	<b>74 78,194</b>	<b>2 45,363</b>		<b>352</b>

	Males	Females	Total
Total Compensation	20,366,046	3,787,426	24,153,472
Average Compensation	69,037	66,446	68,618
Arithmetic Averages:			
Nearest Age	41.1	40.7	41.1
Completed Years of Service	13.9	14.1	13.9
Salary-Weighted Averages:			
Nearest Age	42.0	41.1	41.9
Completed Years of Service	14.8	14.5	14.7
Number of Participants	295	57	352
Percent male / female	83.8%	16.2%	100.0%

## VALUATION SUMMARY

**DEVELOPMENT OF RECOMMENDED CONTRIBUTION**

	<u>12/31/2012</u>	<u>12/31/2013</u>
Total Entry Age Normal Cost	\$ 6,438,815	\$ 6,577,961
<u>Estimated Employee Contributions</u>	<u>2,325,203</u>	<u>2,240,606</u>
Net City Normal Cost	\$ 4,113,612	\$ 4,337,355
Valuation Payroll	\$ 26,121,411	\$ 25,636,626
City Normal Cost Rate (% of pay)	15.7%	16.9%
Actuarial Accrued Liability		
Active Employees	\$ 103,595,214	\$ 104,601,312
Terminated Vested	3,661,363	4,228,451
<u>Retirees and Beneficiaries</u>	<u>265,827,334</u>	<u>275,049,517</u>
Total Actuarial Accrued Liability	\$ 373,083,911	\$ 383,879,280
Actuarial Value of Assets	257,898,061	277,267,947
Net Unfunded Actuarial Accrued Liability	115,185,850	106,611,332
Amortization of Unfunded Actuarial Accrued Liability	\$ 6,775,892	\$ 6,390,889
Amortization Rate (% of Pay)	25.9%	24.9%
Total Contribution Rate	41.7%	41.8%
Projected Fiscal Payroll	\$ 26,983,418	\$ 26,405,725
<b>Total City Contribution</b>	<b>\$ 11,248,857</b>	<b>\$ 11,050,091</b>

Estimated Cash Flow for Next Five Years:

<u>Fiscal Year</u>	<u>City Contributions</u>	<u>Member Contributions</u>	<u>Benefit Payments</u>
2016	11,000,000	2,400,000	27,000,000
2017	11,000,000	2,500,000	27,900,000
2018	11,000,000	2,600,000	28,800,000
2019	11,100,000	2,700,000	29,500,000
2020	11,500,000	2,800,000	29,900,000

## ASSUMPTIONS AND METHODS

**ASSUMPTIONS AND METHODS**

Funding Method:	Entry Age Normal Actuarial Cost Method. The contribution equals the sum of the normal cost and the amount necessary to amortize the unfunded actuarial liability as a level percent of payroll over a closed period of thirty years, decreasing by 1 year to an ultimate period of 15 years (28 years remaining as of December 31, 2013).
Asset Smoothing Method:	Investment gains and losses are determined annually and each is spread over a 5-year period. This is done on a total fund basis. The adjusted value of the healthcare reserve is then excluded from the valuation assets.
Investment Return:	7.60% compounded annually, beginning January 1, 2014. The prior assumption was 7.80%.
Cost of Living (inflation):	The cost of living as measured by the Consumer Price Index (CPI) is assumed to increase at the rate of 3.10% per year. The prior assumption was 3.30%
Salary Increases:	Increases in salary are assumed to be equal to inflation, plus 7.00% for those with less than 5 years of service or 0.75% for all others.
Mortality:	RP2000 with Blue Collar adjustments for males and females. For Disabled members, the disabled version of these tables are assumed with a 5 year age setback for males. Each of these tables is projected to 2008 using Scale BB. Future improvements in mortality for non disabled members are anticipated by projecting these tables an additional 15 years using 50% of Scale BB.
Percent Married:	90% of participants are assumed to be married. Male spouses are assumed to be three years older than their female spouses.
Disability:	Rates of disability vary based on the age of the member. 95% of disabilities are assumed to be duty related.

Samples rates are shown below.

<u>Age</u>	<u>Rate</u>
20	0.0800%
30	0.4000%
40	0.6250%
50	0.7500%
60	0.0000%

**ASSUMPTIONS AND METHODS**

(continued)

Termination: Rates of termination vary based on the service of the member.

Samples rates are shown below.

Years of <u>Service</u>	<u>Fire</u>	<u>Police</u>
0	4.0%	5.0%
1	3.2%	4.3%
5	1.3%	2.2%
10	0.4%	1.0%
15	0.1%	0.4%
20	0.0%	0.0%

Retirement: Rates of retirement vary based on the service of the member as shown below.

Years of <u>Service</u>	<u>Fire</u>	<u>Police</u>
10-24	5.0%	5.0%
25	80.0%	80.0%
26-29	60.0%	25.0%
30+	100.0%	100.0%

The demographic assumptions above are based on the most recent experience study, covering 2005 through 2011. The next Study is scheduled for 2016.

**Changes in assumptions and methods since the prior valuation:**

The investment return and inflation assumptions were changed from 7.80% and 3.30% to 7.60% and 3.10%, respectively. All investment gains and losses prior to 12/31/2012 have been fully recognized in the computation of the Actuarial Value of Assets. An adjusted amount of the Healthcare Reserve, based on the ratio of the Actuarial Value of Assets to the Market Value of Assets, is now used as part of the asset smoothing determination.

## HIGHLIGHTS OF PLAN PROVISIONS



**PLAN PROVISIONS**

There have been no changes in Plan provisions since the prior valuation.

Employee Group Covered: Police Officers and Fire Fighters

Normal Retirement: Age 55 or 25 years of service

Mandatory Retirement: Age 60 for Police and age 70 for Firefighters

Normal Form of Benefit: Monthly life annuity with 50% of the benefit payable to the spouse upon the member's death.

	Contribution Rate
<u>Group</u>	<u>(% of Pay)</u>
Member Contribution Rates:	
Fire	9.08%
Police, Supervisor	9.52%
Police, Non Supervisor	8.50%

Included Compensation: For a police officer member, Included Compensation is defined as annual base salary, overtime pay (including holiday pay), longevity, gun allowance, clothing allowances, sick leave reimbursement (buy-back), shift premium and retroactive pay (prorated by effective date). For a Police Supervisory Division Unit member, the definition also includes compensatory time buy-back (up to a maximum of 160 hours), provided that the compensatory time was earned in the same 24 months on which final average compensation is based. For a firefighter member, Included Compensation is defined as annual base salary, overtime pay, acting pay, ambulance wage differential pay, longevity, holiday pay, field training instructor pay and retroactive pay (prorated by effective date).

Final Average Compensation: Final average compensation means the monthly average of the member's final compensation that is included in Included Compensation, paid during the period of the member's 24 highest consecutive months of credited service as a police officer, or firefighter. If the member has less than 24 months of credited service, the member's final average compensation shall be the monthly average of the Included Compensation paid for his or her total period of credited service.

Normal Retirement Benefit Formula: 3.2% of Final Average Compensation times years of credited service, not to exceed 25 years. Maximum benefit is 80% of Final Average Compensation.

**Termination Prior to Retirement**

Eligibility: Vesting is after 10 years of credited service.

Benefit Amount: Benefit is payable beginning at age 55 and computed in the same manner as the Normal Retirement Benefit, but based on credited service and Final Average Compensation at date of termination.

**PLAN PROVISIONS**

*(continued)*

**Duty Disability**

Eligibility	Members are eligible for Duty Disability Retirement benefits immediately
Benefit Amount (Before Retirement Eligibility)	The Duty Disability Retirement Benefit payable to members is equal to 2/3 of Final Average Compensation.

Benefit Amount (After Retirement Eligibility)	Benefit is paid at the effective date of disability retirement as a Life Annuity and is equal to the accrued Retirement Benefit. In computing the benefit amount, credited service is increased to include the period of disability, and Final Average Compensation is calculated using current rates of compensation for those with similar rank. The Disability Benefit will be offset by any workers' compensation payable on account of the disability.
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**Non Duty Disability**

Eligibility	Members are eligible for Non Duty Disability Retirement benefits after completing 10 years of service.
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Benefit Amount	Benefit is paid at the effective date of disability retirement as a Life Annuity and is equal to the accrued Retirement benefit, with a maximum benefit equal to 2/3 of the annual rate of compensation of either a full-paid patrolman or a full-paid firefighter as of the date of retirement, whichever is higher.
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**Death incurred in the Line of Duty**

Eligibility	The Death in Line of Duty Benefit is payable to the survivors of a member who died as a result of an injury or disease arising out of and in the course of duty.
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Benefit Amount	A Life Annuity benefit equal to 86% of the Normal Retirement Benefit is payable to the widow or widower, with a minimum benefit equal to 1/3 of the deceased member's Final Compensation. In addition, unmarried children under the age of 21 will receive a benefit equal to 1/4 of the deceased member's Final Compensation, divided equally among children.
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**Non Duty Pre-Retirement Death**

Eligibility	The non duty pre retirement death benefit is payable upon the death of a member after earning 10 years of credited service.
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Benefit Amount	50% of the accrued retirement benefit, computed in the same manner as the Retirement Benefit payable as a Life Annuity.
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**Optional Benefit Forms**

Prior to retirement, a member may elect a reduced benefit of either 93% or 86% of the original amount, thereby increasing the spouse benefit to either 75% or 86%, respectively.

**PLAN PROVISIONS**

*(continued)*

**Ad Hoc Cost-of-Living Adjustments**

One-time cost of living increases were granted in 1973, 1984 and 1987.

**Post Retirement Benefit Adjustments**

Effective January 1, 1995 and each January 1 thereafter, the annual benefit amount will be increased by \$525 for each retiree who meets each of the following conditions:

- 1) 25 or more years of credited service at the time of retirement
- 2) Age 60 as of the January 1 increase date
- 3) Has been retired at least 6 months as of the January 1 increase date

The \$525 amount is reduced for retirees who elected the 75% or 86% optional forms of benefit (\$488.25 and \$451.50, respectively).

Spouses of deceased members are also eligible for benefit increases each January 1 if:

- 1) The deceased member had at least 25 years of credited service at the time of retirement
- 2) The deceased member would have attained at least age 60 as of the January 1 increase date
- 3) The deceased member had been deceased at least 6 months as of the January 1 increase date.

The spouse's annual benefit increase amount is adjusted based on the form of payment elected by the deceased member, according to the following schedule:

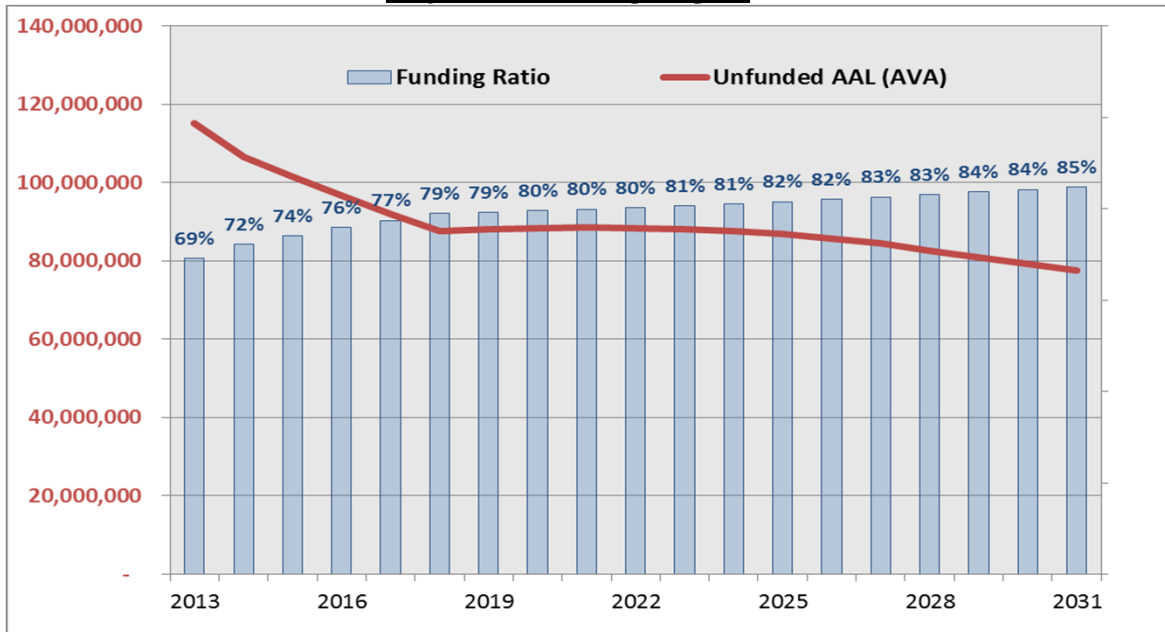
<u>Spouse Benefit %</u>	<u>Annual Benefit Increase</u>
50%	\$262.50
75%	\$393.75
86%	\$451.50

The benefit increases accumulate from year to year, but cumulative benefit increases shall not exceed cumulative increases in the Consumer Price Index.

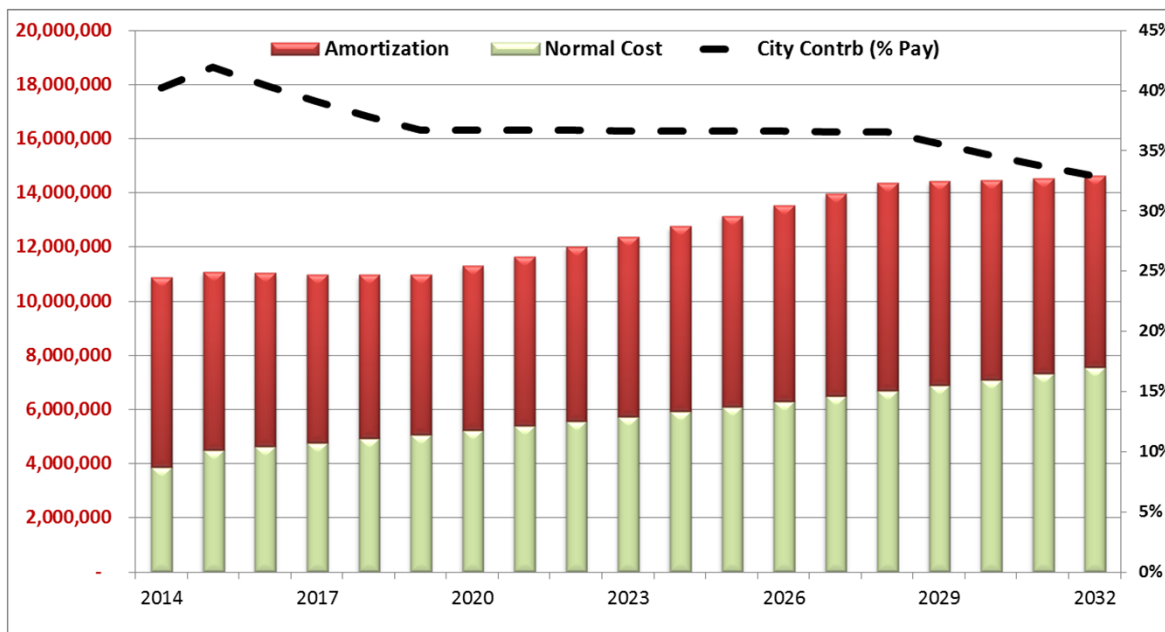
**APPENDIX I: FUTURE FUNDING AND CONTRIBUTIONS**

The graphs below show a projection of expected funding progress and City contributions to the Fund. The actual funding progress and contributions over this time period will differ from what is shown here, due to the actual experience of the Plan. However, we can see that the Plan is on a path to decreasing the unfunded liability (top graph, red line) and improving the funding ratio to above 80% within the next decade. The City contribution rate (percentage of payroll) is expected to decline during this time, from its current level of about 40% of pay to closer to 30% of pay.

**Projection of Funding Progress**



**Projection of City Contributions**



**Appendix II: History of Employer Contributions and Funding Progress**

<u>Fiscal Year Ending</u>	<u>Annual Required Contribution (ARC)</u>	<u>Actual Contribution</u>
6/30/2003	2,636,688	2,636,688
6/30/2004	3,286,596	3,273,450
6/30/2005	3,333,869	3,333,869
6/30/2006	4,658,703	4,658,703
6/30/2007	5,385,960	5,385,960
6/30/2008	6,520,974	6,520,974
6/30/2009	6,094,397	6,483,000 (1)
6/30/2010	7,179,360	6,790,757 (1)
6/30/2011	8,240,688	8,240,688
6/30/2012	9,242,173	9,057,080 (2)
6/30/2013	10,133,599	10,133,599 (3)
6/30/2014	11,248,857	11,248,857
6/30/2015	11,050,091	To Be Determined (4)

(1) The City contributed in excess of its FY 2009 ARC. The City's FY 2010 contribution was reduced by the dollar amount of the FY 2009 overpayment.

(2) The FY 2012 City contribution was reduced by \$185,093 in recognition of additional contributions by International Association of Firefighters (IAFF) employees, which were negotiated and contributed after the establishment of the June 30, 2012 ARC from the December 31, 2010 valuation.

(3) Fiscal year 2013 ARC reflects changes made to actuarial assumptions based on an Experience Study. Changes included a decrease in the assumed rate of return from 8.0% to 7.8%. A closed amortization period was also adopted as of 12/31/2011, beginning at 30 years and decreasing each year until 15 years is reached.

(4) Fiscal year 2015 ARC reflects changes made to assumed return and inflation from 7.8% and 3.3% to 7.6% and 3.1%, respectively. ARC also reflects change in asset smoothing to immediately recognize all investment gains and losses prior to 12/31/2012.

<u>Valuation Date</u>	<u>Actuarial Value of Assets (AVA)</u>	<u>Actuarial Accrued Liability (AAL)</u>	<u>Percentage Funded</u>	<u>Unfunded Actuarial Accrued Liability</u>
12/31/2002	280,686,000	259,282,000	108.3%	(21,404,000)
12/31/2003	277,947,000	267,786,000	103.8%	(10,161,000)
12/31/2004	275,807,000	279,873,000	98.6%	4,066,000
12/31/2005	275,216,000	290,299,000	94.8%	15,083,000
12/31/2006	278,839,000	308,193,000	90.5%	29,354,000
12/31/2007	293,571,000	315,635,000	93.0%	22,064,000
12/31/2008	287,394,000	326,673,000	88.0%	39,279,000
12/31/2009	280,342,000	337,315,000	83.1%	56,973,000
12/31/2010	276,377,041	359,293,016	76.9%	82,915,975
(5) 12/31/2011	264,492,738	372,547,509	71.0%	108,054,771
12/31/2012	257,898,061	373,083,911	69.1%	115,185,850
(6) 12/31/2013	277,267,947	383,879,280	72.2%	106,611,332

(5) Reflects changes made to actuarial assumptions, based on Experience Study, including a reduction in the assumed return 8.0% to 7.8%.

(6) Reflects changes made to assumed return and inflation from 7.8% and 3.3% to 7.6% and 3.1%, respectively. AVA also reflects change in asset smoothing to immediately recognize all investment gains and losses prior to 12/31/2012.