Gabriel Roeder Smith & Company
Consultants & Actuaries

THE POLICE AND FIRE RETIREMENT SYSTEM OF THE CITY OF DETROIT

ANNUAL ACTUARIAL VALUATION OF COMPONENT II

JUNE 30, 2014

OUTLINE OF CONTENTS

GRS
Gabriel Roeder Smith & Company
Consultants & Actuaries
One Towne Square
Suite 800
Southfield, MI 48076-3723
248.799.9000 phone
248.799.9020 fax
www.gabrielroeder.com

November 24, 2015

Board of Trustees
The Police and Fire Retirement System of the City of Detroit

The City of Detroit filed for bankruptcy on July 18, 2013. A final Plan of Adjustment ("POA") was confirmed on November 7, 2014 and the official exit from bankruptcy was on December 10, 2014. In connection with the POA, very significant changes were made to the benefits that the Police and Fire Retirement System provides and to the contributions that it will receive. In particular, the benefits provided by the Retirement System were divided into two separate plans, referred to as "Component I" and "Component II." The benefits provided in each component are effective July 1, 2014 and are described in detail in Emergency Manager Order No. 44, dated December 8, 2014. In very general terms, Component I provides benefits for service rendered on and after July 1, 2014 and Component II provides benefits for service rendered prior to July 1, 2014.

This report provides key results of the **Annual Actuarial Valuation** of the annuity and pension liabilities of the Police and Fire Retirement System of the City of Detroit. The date of the valuation was **June 30, 2014. The results provided herein relate solely to the Component II benefits. Component I benefits will be the subject of a separate report.** The purposes of the valuation are to measure the funding progress of Component II in accordance with the terms of the POA and to provide actuarially determined contribution amounts, given POA conditions and assumptions for Fiscal Year 2016 for Component II for comparison with the contribution amounts provided in the POA. The results of the valuation are not applicable for other purposes. In particular, the information provided in this report is not suitable for financial reporting in connection with GASB Statement No. 67. Such information was provided in a separate report. Information regarding potential benefit restoration as allowed for in the POA will be provided in a separate report.

This report was prepared at the request of the Board and is intended for use by the Retirement System and those designated or approved by the Board. This report may be provided to parties other than the System only in its entirety and only with the permission of the Board.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as: plan experience differing from that anticipated by the economic and demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Due to the limited scope of the actuary's assignment, the actuary did not perform an analysis of the potential range of such future measurements

The valuation was based upon records maintained and furnished by the Retirement System staff concerning active members, retirees and beneficiaries, and financial accounts as of the valuation date. Data was checked for year-to-year consistency, but was not otherwise audited by the actuary. We are not responsible for the completeness or accuracy of the data. Certain necessary data was not available in time to produce the results in this report and it was necessary for us to use approximations. Please see related discussion in the comments section of this report.

The assumptions used in the valuations concerning future experience are summarized in the Appendix of this report. Except for the assumed rate of investment return, the actuarial assumptions used for the valuation are set by the Board based upon advice of the actuary and other parties. The assumed rate of investment return was set to 6.75% in the POA and is therefore a "prescribed assumption set by another party" as discussed in Actuarial Standard of Practice No. 4. In our judgement, all of the actuarial assumptions used for the valuation are reasonable for purposes of the measurement.

This report has been prepared by actuaries who have substantial experience valuing public sector retirement systems. To the best of our knowledge, this report is complete and accurate and was made in accordance with standards of practice promulgated by the Actuarial Standards Board.

The signing actuaries are independent of the plan sponsor.

David T. Kausch and Judith A. Kermans are Members of the American Academy of Actuaries (MAAA), and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

This report does not evaluate the plan sponsor's ability or willingness to make contributions to the Retirement System. In particular, given the funded level of Component II, plan sponsor contributions are critical if further benefit reductions are to be avoided. Indeed the employer contributions set forth in the POA are expected to lead to a decrease in the funded status over the next 8 years, if all assumptions are met.

Actuarial Valuations are not precise measures of future obligations. Rather, they are estimates of future obligations based on assumptions about future events. These estimates are determined through mathematical modeling techniques. Estimates can vary as much as 5% depending on the specific modeling techniques used for a given set of assumptions. The model is performed annually to adjust for actual experience and any potentially new information regarding assumed future experience.

Respectfully submitted,

David T Kausch

David T. Kausch, FSA, EA, MAAA

Judith A. Kermans

Judith A. Kermans, EA, MAAA

Kenneth G. Alberts

Kenneth G. Alberts

JAK:mrb

VALUATION RESULTS

VALUATION RESULTS

The expected contributions for FY 2015 and beyond are provided in the Plan of Adjustment (POA) and are shown below.

	Contribution Source (Millions)		
Fiscal Year	State	DIA	Total
2015	$ 96.0	$ 18.3	$ 114.3
2016	-	18.3	18.3
2017	-	18.3	18.3
2018	-	18.3	18.3
2019	-	18.3	18.3
2020	-	18.3	18.3
2021	-	18.3	18.3
2022	-	18.3	18.3
2023	-	18.3	18.3
Total	**$ 96.0**	**$ 164.7**	**$ 260.7**

We have assumed the contributions outlined in the POA will not change. An estimate of the probability of those payments being made was outside the scope of this project, not required by Actuarial Standards, and was, therefore, not made.

Unfunded Accrued Liability +

	($ millions)
UAAL * as of June 30, 2014	$ 731.1
Anticipated POA Contribution (EOY)	114.3
Anticipated Expenses@	-
Interest at 6.75%	49.4
Projected UAAL * as of June 30, 2015	$ 666.2
Anticipated POA Contributions for FY 2016	**18.3**
Estimated Employer Contributions for FY 2024 #	**$ 94.5**

* *Unfunded Actuarial Accrued Liability*

@ *In accordance with the Plan Document, the mandated 6.75% rate of return is net of investment and administrative expenses.*

\# *Assuming the POA contributions through 2023 and a 30-year level principal closed amortization thereafter.*

\+ *Because no service is being accrued in Component II, no Normal Cost contribution is included.*

The POA contributions result in a defunding of the plan between now and June 30, 2023, which was contemplated by the POA. In fact, the anticipated POA contribution for FY 2016 is less than half of the interest that will accrue on the UAAL. The Estimated Employer Contribution for FY 2024 is based on a projection of results assuming only the POA contributions are made and all future experience between the valuation date and FY 2024 is as assumed. Actual experience will result in changes to this result and the final result (from the June 30, 2023 actuarial valuation) could be materially different than shown above.

At the request of the Board, in addition to the status valuation calculations on page 3, we illustrate what the funding requirements would be if the FY 2016 contributions were determined by an actuarial valuation.

In the chart below, we illustrate two alternate funding policies for FY 2016. The first policy is an illustration of funding the UAAL over the expected remaining active service life of this group. The second policy is similar to the Board's existing (pre-bankruptcy) policy, but slightly accelerated to prevent insolvency prior to the end of the funding period. The illustrations are intended to show that there are a broad range of possible policies, but are not intended to show a specific recommendation or a minimum (or maximum) level of contributions.

Funding Policy 1 is based on amortizing the UAAL over the average remaining service life of active members (6 years) using level dollar amortization.

Funding Policy 2 is based on amortizing the UAAL with level principal payments over a 30-year period plus interest. This method is also known as level principal declining interest amortization.

Illustrative Contribution Shortfall	($ millions)
(1) Illustrative Contribution for FY 2016 (Funding Policy 1)	$ 138.7
(2) Illustrative Contribution for FY 2016 (Funding Policy 2)	67.2
(3) Actual Contribution for FY 2016 (POA)	18.3
Fiscal Year 2016 Shortfall - Funding Policy 1: (1) - (3)	$ 120.4
Fiscal Year 2016 Shortfall - Funding Policy 2: (2) - (3)	$ 48.9

Recommendation: We recommend that additional contributions be made to the Component II Plan. Increasing contributions increases the benefit security of the members.

Present Value, June 30	Amount
Accrued Pension Liabilities	
Retirees and beneficiaries	$3,050,334,660
Inactive members future deferred pensions	33,030,037
Active members	744,143,295
Total accrued pension liabilities	3,827,507,992
Pension fund balances	3,096,387,500
Unfunded accrued pension liabilities	$ 731,120,492
Accrued Annuity Liabilities	
Retirees and beneficiaries	
Future annuities	$ 4,238,339
Reserve for outstanding refunds & contingencies	20,319,188
Total	$ 24,557,527
Members annuities & future refunds	155,258,272
Total accrued annuity liabilities	179,815,799
Annuity fund balances	179,815,799
Unfunded accrued annuity liabilities	$ 0
System Totals	
Actuarial accrued liabilities	$4,007,323,791
Accrued assets	3,276,203,299
Unfunded actuarial accrued liabilities#	$ 731,120,492

FUNDED RATIO - POA

		Defined Benefit	ASF	Total
A	Actuarial Accrued Liability	$ 3,852,065,519	$ 155,258,272	$ 4,007,323,791
B	Market Value of Assets	$ 3,120,945,027	$ 155,258,272	$ 3,276,203,299
C	Unfunded Actuarial Accrued Liability (A - B)	$ 731,120,492	$ -	$ 731,120,492
D	Funded Ratio (B/A)	81.0%	100.0%	81.8%

The POA Liability is an expected return based measurement of the pension obligation. It is based upon the mandated 6.75% interest rate assumption (assumption prescribed by another party). It determines an amount that will be sufficient to provide benefits if the portfolio earns the expected 6.75% return on assets and all other assumptions are met. This measure is appropriate for assessing the need for or amount of future contributions if all assumptions are met. This measure is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation, in other words, of transferring the obligation to a third party in a market value type transaction.

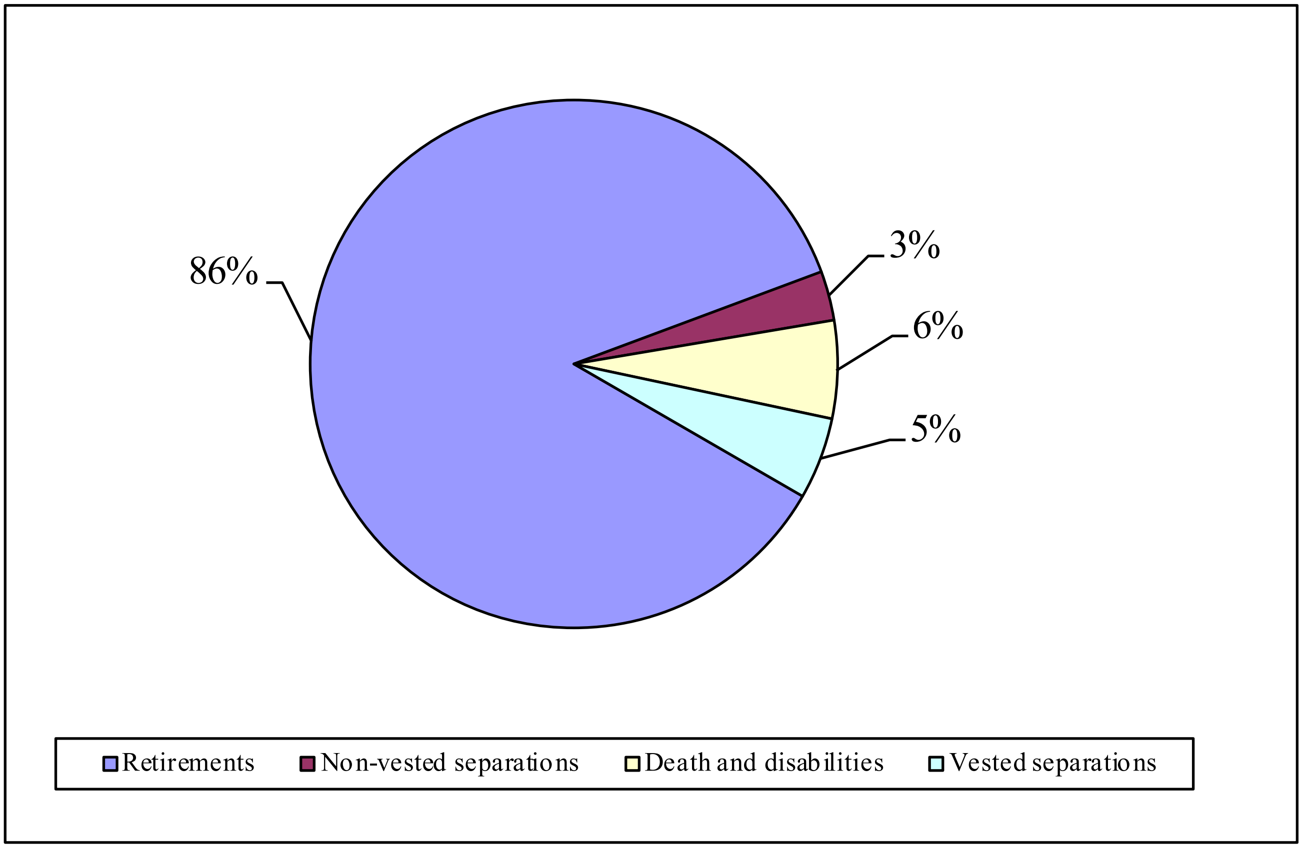
FUNDED RATIO- SOLVENCY

		Defined Benefit	ASF	Total
A	Actuarial Accrued Liability	$ 5,124,141,134	$ 155,258,272	$ 5,279,399,406
B	Market Value of Assets	$ 3,120,945,027	$ 155,258,272	$ 3,276,203,299
C	Unfunded Actuarial Accrued Liability (A - B)	$ 2,003,196,107	$ -	$ 2,003,196,107
D	Funded Ratio (B/A)	60.9%	100.0%	62.1%

The Solvency Liability is a market-based measurement of the pension obligation. It represents the amount the plan would need to invest in low risk securities to provide the benefits with greater certainty. For this purpose, the solvency liability is computed at 4.29% as of June 30, 2014, based on the long-term municipal bond rate ("State & local bonds" rate from Federal Reserve statistical release (H.15) as of June 28, 2014). No adjustment has been made for the credit quality of the plan sponsor. This measure may not be appropriate for assessing the need for or amount of future contributions. This measure may not be appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligation.

The difference between the two measures (POA and Solvency) illustrates the Plan savings the sponsor anticipates by taking on the risk in a diversified portfolio.

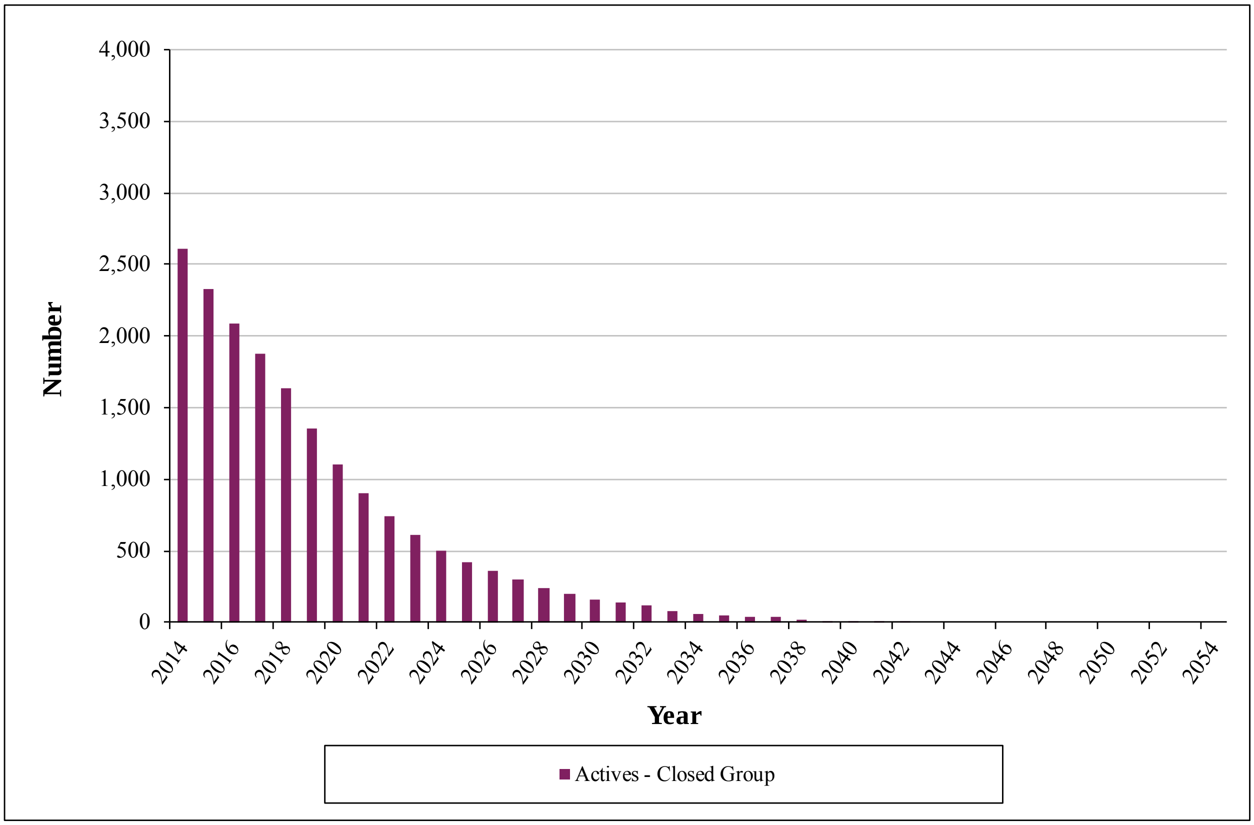
EXPECTED TERMINATIONS FROM ACTIVE EMPLOYMENT FOR CURRENT ACTIVE MEMBERS



The chart above shows the expected future development of the present population in simplified terms. The Retirement System presently covers 3,233 active members. Eventually, 84 members are expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. 2,986 members are expected to receive monthly retirement benefits either by retiring directly from active service (including drop), or by retiring from vested deferred status. 163 members are expected to become eligible for death-in-service or disability benefits.

EXPECTED TERMINATIONS FROM ACTIVE EMPLOYMENT FOR CURRENT ACTIVE MEMBERS

Shown below is a graph of projected active members remaining in the Retirement System. It is projected that less than half of the current active population will be active by 2020.



Actual verses expected normal retirements for the 2014 fiscal year is shown below:

Year Ended June 30,	Expected	Actual
2014	200	100

COMMENTS AND CONCLUSION

Experience

During the prior year this plan experienced significant changes in structure, methods and assumptions which greatly overshadow the impact of any gains or losses due to experience in specific risk areas. We were able to isolate a few of the major risk areas for this purpose. For example, investment experience during the year ended June 30, 2014 was favorable. The rate of return measured on a market value basis was 19.8%.

Annuity Reserve Fund

The Annuity Reserve Fund (ARF), as reported, was $20 million higher than the related accrued liabilities for Retirees and Beneficiaries. The Board made a transfer of $12 million from the Annuity Reserve Fund to the Pension Accumulation Fund in 2001, a transfer of $5 million in 2005 and a transfer of $22 million in 2011.

ASF Interest Credits

The ASF fund cannot be credited with more than 5.25% (or the total fund earnings, if less). We understand that any future arbitrage that occurs will be transferred to Component I assets to the extent needed for transition liability and, therefore, we did not model any arbitrage as part of this valuation.

Data Issues and Approximations

The data provided for this valuation did not reflect the plan freeze. Consequently, it was necessary for us to use approximations to estimate the frozen accrued benefits. While in our judgement, the approximations are reasonable, an estimate of the potential range of error in those approximations was outside the scope of this study. It is important that complete data be provided as soon as possible to minimize the probability of an important decision being made based upon wrong information. We would be pleased to redo this valuation with revised data if such can be made available.

Changes in Assumptions and Methods

- The actuarial cost method was changed in conjunction with the benefit freeze. All frozen benefits are assumed to be fully accrued, and hence there is no normal cost. This is a form of the actuarial cost method referred to as the Unit Credit Cost Method.
- The mortality table was updated to RP-2014 with blue collar adjustment in conjunction with a study of mortality among plan participants covering the years 2008-2013 and dated February 13, 2015. Generational mortality improvement was assumed based on MP-2014.
- Investment return was lowered to 6.75% per annum, as prescribed by the POA.
- Assets were set to the market value as of the valuation date (no smoothing).
- This valuation of Component II does not depend on price inflation or wage inflation assumptions. For the prior annual actuarial valuation, the price inflation assumption was 3.0% and the wage inflation assumption was 4.0% per year respectively. We recommend reviewing and updating these assumptions prior to completing a valuation of Component I benefits.

For purposes of restoration, the plan document specifically states that the 6.75% assumed rate of return is net of administrative and investment expenses. However, the references to the assumed rate of return in the plan document are silent on this point. We have been instructed by the System that the assumed rate of return of 6.75% is net of administrative and investment expenses for purposes of this valuation.

COMMENTS AND CONCLUSION

Restoration

This valuation assumes no future restoration of Component II benefits. Any future restoration will be reflected beginning in the next valuation after being granted.

Future Results

While the FY 2015 investment performance has not yet been provided to us, most public plans (for which information is available) earned less than 5%. If the retirement System's experience is similar, this will result in downward pressure on the funded status and upward pressure on the FY 2024 contribution requirements above what is shown in this report.

The POA mandated contribution for FY 2016 and beyond are expected to defund the Retirement System, even if all assumptions are realized. In FY 2016, the POA mandated contributions will be less than ½ of the interest on the UAAL.

Recommendation 1

We recommend that every potential action be taken to generate contributions to the Retirement System above and beyond those provided in the POA.

Recommendation 2

We recommend that the System compute frozen accrued benefits as soon as possible and report them to the Actuary for the June 30, 2015 valuation. If important decisions are to be made based on this valuation, we recommend further that the valuation be redone based upon actual computed frozen accrued benefits.

Recommendation 3

We recommend that a study be undertaken to develop a funding policy for FY 2024 and beyond. The increase in contributions that is expected at that time is so extreme that it cannot be ignored until then. All stakeholders should agree on the funding method well before that date comes. If not, there could be a significant risk of contribution defaults and/or further benefit cuts.

Conclusion

The POA contributions fall short of contributions that would result from either of the funding policies illustrated in this report. Given those contributions, and the fact that FY 2015 will likely show an investment loss, the funding status is expected to decline in the next valuation. The FY 2024 contribution is expected to be very high compared to City contributions in the immediately preceding years. Planning for the FY 2024 contribution level is very important. **Once again, we recommend that every potential action be taken to generate contributions to the Retirement System above and beyond those provided in the POA.**

DATA FURNISHED FOR VALUATION

Component II Frozen Benefits

All Component II benefits are frozen as of June 30, 2014 based on service and average final compensation accrued as of that date and the provisions of the Detroit General Retirement System as it existed on June 30, 2014 and all future cost-of-living adjustments ("COLA's") were reduced from 2.25% to 1.0125%. The benefits evaluated in this report are the frozen reduced benefits. Component II benefits are payable after separation from service, upon meeting the eligibility conditions of the plan as it existed on June 30, 2014, regardless of whether the individual is eligible to receive a Component I benefit at that time.

Our understanding of the June 30, 2014 plan provisions is provided below for completeness. The material below does not have legal standing and is not intended to cover all potential situations that could occur. If there are discrepancies between the description below, and appropriate legal documents, the latter necessarily govern.

Age and Service Retirement

Eligibility - 25 years of service regardless of age. 20 years of service regardless of age for eligible DPOA and DFFA members. DFFA members must retire by age 60.

Annual Amount - An annuity equal to the actuarial equivalent of the member's accumulated contribution account plus a defined benefit, which, when added to the annuity will provide the following:

Pre-1969 Members - For all service earned up to April 5, 2011 for LSA and Fire equivalent members, and up to September 1, 2011 for DPOA and Fire equivalent members, 2.5% of AFC times the first 25 years of service, with a maximum allowance of 15/22 of a police officer's or firefighter's annual rate of compensation (actuarially reduced to reflect early payment).

For all service earned after April 5, 2011 for LSA and Fire equivalent members, and after September 1, 2011 for DPOA and Fire equivalent members, 2.1% of AFC times the first 25 years of service, with a maximum allowance of 15/22 of a police officer's or firefighter's annual rate of compensation.

1969 Plan Members - For all service earned up to April 5, 2011 for LSA and Fire equivalent members, and up to September 1, 2011 for DPOA and Fire equivalent members, 2.5% of AFC times the first 25 years of service plus 2.1% of AFC times each of the next 10 years of service.

For all service earned after April 5, 2011 for LSA and Fire equivalent members, and after September 1, 2011 for DPOA and Fire equivalent members, 2.1% of AFC times each year of service, up to 35 years of service.

Members may elect to receive their accumulated contribution account in a lump sum after 25 years of service (20 years of service for eligible DPOA and DFFA members). The defined benefit at retirement is then reduced by the actuarial equivalent of the amount of principal withdrawn. No reduction is made with regard to the interest portion of the withdrawal. Pre-1969 plan members may elect 1969 plan benefits at the time of retirement.

Type of Average Final Compensation (AFC) - Average of the current compensation for the ranks held in each of last 5 years (last 3 years for DPCOA, Executive Members and their Fire equivalents). Pension benefits for non-union employees may not be diminished due to a reduction in compensation because of fiscal emergency. AFC includes prior longevity distributions during the averaging period in accordance with the following schedule: 1% of compensation after 5 years of service, 2% after 11 years, 3% after 16 years and 4% after 21 years. A member may elect that upon retirement or upon death before retirement either (i) a lump sum payment equal to 85% (100% for DPOA and DPCOA members) of the amount of his or her unused accumulated sick leave bank, or (ii) to have the 3-year average of 25% of the value of the accumulated unused sick leave bank added to his or her AFC. Any member electing the AFC adjustment option will also be paid a lump sum equal to the remaining value of the sick leave bank as provided in (i) above. Lump sum payments are not paid by the retirement system.

Deferred Retirement (vested benefit)

Eligibility - 10 years of service for DPOA and Fire equivalents, age 40 with 8 years of service for all others.

Annual Amount - Same as regular retirement but based on average final compensation and credited service at the time of termination.

Benefit Commencement - DPOA and Fire equivalent members hired after 6/30/85: Unreduced benefit begins at age 62. ***All other members***: Unreduced benefit begins at the age when the member would have first been eligible for regular retirement had the member continued in City service. **All** members may elect a reduced benefit payable immediately.

Duty Disability Retirement

Eligibility - No age or service requirement.

Annual Amount – A basic benefit of 50% of final compensation and a supplemental benefit of 16-2/3% of final compensation is payable for 24 months. After 24 months, members disabled from any occupation continue to receive both benefits; otherwise, only the 50% benefit is then payable. Upon attaining 25 years of service, the disability benefit is 50% of final compensation. Members convert to regular retirement benefit at age 65. Worker’s compensation payments are offset. Members who have already filed under the old duty disability plan will receive 66-2/3% of final compensation payable to eligibility date for regular retirement.

Non-Duty Disability Retirement

Eligibility - 5 years of service.

Annual Amount - Computed as a regular retirement benefit, but based on average final compensation and credited service at the time of disability. Minimum benefit is 20% of average final compensation.

Duty Death Before Retirement

Eligibility - No age or service requirement.

Annual Amount – Surviving spouse receives 5/11 of police officer’s or firefighter’s compensation and each child under age 18 receives 1/10 of such compensation with a maximum total of 7/33 of such compensation. If there is no surviving spouse, each child receives 1/4 of such compensation with a maximum total of 1/2 of such compensation. If there is no surviving spouse or children, each dependent parent receives 1/6 of such compensation. Worker’s compensation payments are offset.

SUMMARY OF BENEFIT PROVISIONS (CONCLUDED)

Non-Duty Death Before Retirement

Eligibility - No age or service requirement.

Annual Amount - Same as a regular retirement benefit to a surviving spouse, but reduced in accordance with a 100% joint and survivor option election. Minimum benefit is 20% of average final compensation. Each child under 18 receives 1/7 of police officer's or firefighter's compensation with a maximum total of 2/7 of such compensation. If there is no spouse or children, each dependent parent receives 1/7 of such compensation.

Post-Retirement Cost-of-Living Adjustments

Pre-1969 Members - Allowances increase in proportion to active member compensation for the corresponding rank.

1969 Plan Members - Police retired after July 1, 2001, certain Police classes retired after July 1, 1998 and all Fire members: For all service earned up to April 5, 2011 for LSA members (September 1, 2011 for DPOA members) pensions increase by 2.25% of the **current** pension amount each July 1. No cost-of-living adjustments for service earned after April 5, 2011 for LSA members (September 1, 2011 for DPOA members).

Member Contributions

5% of covered compensation payable until first eligible for regular retirement.

DROP plan

Members with 25 years (20 years for DPOA members) of service may elect to participate in the DROP. When a DROP election is made, the member ceases to accrue any further age and service retirement benefits. Seventy five percent (75%) of the member's benefit (accrued to their DROP date) is contributed to a DROP account (a defined contribution account). At retirement the member is entitled to the balance in the DROP account and a monthly benefit equal to 100% of their benefit accrued to their DROP date, increased by any post-retirement increases that the member would have received, had the member been retired. Fire members must retire from the DROP plan at age 60. Participation in the DROP is limited to 10 years for LSA members electing to DROP after April 5, 2011.

Reported Assets
(Market Value)

Market Value - June 30, 2014	
Cash & Deposits	$ 135,060,768
Receivables	62,592,961
Domestic Equities	1,295,157,265
Fixed Income	697,555,113
Real estate	662,300,305
Other	528,645,601
Accounts payable	(105,108,714)
Total Current Assets	**$ 3,276,203,299**

Reserve Accounts

Funds	Fund Balances June 30, 2014	Fund Balances June 30, 2013
Annuity Savings	$ 155,258,272	$ 178,231,705
Annuity Reserve	24,557,527	22,738,451
Total Annuity Funds	179,815,799	200,970,156
Pension Accumulation	(478,148,374)	(344,811,707)
Pension Reserve	2,858,670,778	2,911,280,932
Accrued Liability Fund Reserve	757,380,130	701,277,898
Survivor Benefit	6,286,401	5,820,742
Market Stabilization Fund	(47,801,435)	-
Total Pension Funds	3,096,387,500	3,273,567,865
Total Fund Balances (Funding Value)	$3,276,203,299	$3,474,538,021

Revenues and Expenditures

	Pension Funds	Annuity Funds +	Total Funds
Market Value July 1, 2013	$ 2,833,602,908	$ 200,970,156	$3,034,573,064
Revenues			
Member Contributions	0	7,783,141	7,783,141
Employer Contributions	0	0	0
Investment Income	559,670,447	9,090,346	568,760,793
Transfers	0	0	0
Total	$ 559,670,447	$ 16,873,487	$ 576,543,934
Expenditures			
Benefit Payments	285,512,629	0	285,512,629
Refund of Member Contributions	0	38,027,844	38,027,844
Adjustment (Prior Year Cont.)	0	0	0
Administrative Expenses	11,373,226	0	11,373,226
Total	$ 296,885,855	$ 38,027,844	$ 334,913,699
Market Value June 30, 2014	$3,096,387,500	$179,815,799	$3,276,203,299
Market Value Rate of Return	20.8%	4.9%	19.8%

\+ *Reported Market Value of Annuity Savings Fund and Annuity Reserve Fund.*

RETIREES AND BENEFICIARIES JUNE 30, 2014
TABULATED BY ATTAINED AGE@

Attained Age	Age & Service		Disability		Death-in-Service		Totals	
	No.	Monthly Allowances	No.	Monthly Allowances	No.	Monthly Allowances	No.	Monthly Allowances
Under 20*	6	$ 21,605			48	$ 25,347	54	$ 46,952
20-24	2	5,225					2	5,225
25-29	1	1,783					1	1,783
30-34	4	8,728	24	$ 70,813	3	4,742	31	84,283
35-39	6	12,136	60	187,158	9	14,397	75	213,691
40-44	25	29,813	87	275,302	9	16,885	121	322,000
45-49	181	456,266	95	296,694	16	28,714	292	781,674
50-54	279	789,784	132	381,320	15	25,367	426	1,196,471
55-59	518	1,476,173	152	415,383	23	47,925	693	1,939,481
60-64	1,174	3,729,738	335	864,582	39	70,027	1,548	4,664,347
65-69	1,351	4,190,702	435	1,052,924	49	80,749	1,835	5,324,375
70-74	936	2,585,458	230	526,874	29	50,497	1,195	3,162,829
75-79	515	1,273,046	86	204,733	13	23,261	614	1,501,040
80-84	451	1,017,246	57	139,894	22	41,366	530	1,198,506
85-89	529	1,117,630	71	178,025	24	47,509	624	1,343,164
90-94	256	485,798	25	61,962	7	12,670	288	560,430
95 & Over	61	106,752	4	9,910	1	2,049	66	118,711
Totals	**6,295**	**$17,307,883**	**1,793**	**$4,665,574**	**307**	**$491,505**	**8,395**	**$22,464,962**

@ *Includes both pre-1969 and 1969 retirees. Allowances being paid to DROP members are not reflected. Allowances shown are amounts as reported in the raw data.*

* *May include records with defective birth dates.*

INACTIVE VESTED MEMBERS JUNE 30, 2014

Attained Age	No.	Estimated Annual Allowances
Under 40	63	$ 974,846
40-44	73	1,261,526
45-49	53	955,179
50-54	35	760,588
55-59	16	312,124
60-64	12	256,201
65 & over	20	534,601
Totals	**272**	**$5,055,065**

PRE-1969 RETIREES AND BENEFICIARIES JUNE 30, 2014
TABULATED BY ATTAINED AGE

Attained Age	Age & Service# No.	Age & Service# Monthly Allowances	Disability# No.	Disability# Monthly Allowances	Death-in-Service No.	Death-in-Service Monthly Allowances	Totals No.	Totals Monthly Allowances
Under 20*								
20-24								
25-29								
30-34								
35-39	1	$ 958	1	$ 2,534			2	$ 3,492
40-44								
45-49	1	1,054					1	1,054
50-54	3	3,591					3	3,591
55-59	6	5,051			1	$ 1,763	7	6,814
60-64	14	21,623			3	6,147	17	27,770
65-69	147	274,756	54	120,883	14	27,025	215	422,664
70-74	382	789,806	128	281,597	16	28,084	526	1,099,487
75-79	324	671,391	68	152,252	11	18,705	403	842,348
80-84	297	584,173	45	99,292	20	35,786	362	719,251
85-89	410	795,418	65	159,141	22	41,799	497	996,358
90-94	235	432,585	25	61,962	6	11,950	266	506,497
95 & Over	58	103,206	4	9,910	1	2,049	63	115,165
Totals	**1,878**	**$3,683,612**	**390**	**$887,571**	**94**	**$173,308**	**2,362**	**$4,744,491**

** May include records with defective birth dates.*
 # Includes survivor beneficiaries of service and disability retirees.

DROP PARTICIPANTS JUNE 30, 2014

Attained Age	No.	Estimated Monthly Allowances &
35-39	1	$ 1,539
40-44	44	70,712
45-49	146	303,488
50-54	206	485,591
55-59	160	431,688
60-64	51	142,138
65-69	14	41,380
70-74	3	9,667
Totals	**625**	**$1,486,203**

& Reflects the 75% of reported monthly benefits being paid into DROP accounts.

ACTIVE MEMBERS JUNE 30, 2014
BY ATTAINED AGE AND YEARS OF SERVICE@

Police Members

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll *
Under 20	2							2	$ 58,704
20-24	55							55	1,758,405
25-29	78	41						119	4,764,904
30-34	35	94	71	2				202	9,447,158
35-39	18	54	188	156	1			417	20,880,638
40-44	7	27	136	407	45	1		623	32,679,243
45-49	6	14	56	223	102	31		432	23,386,550
50-54	4	4	26	80	45	99	4	262	14,598,435
55-59		2	7	24	21	75	28	157	9,509,159
60			1		3	7	12	23	1,412,729
61						7	12	19	1,167,313
62			1			4	10	15	853,453
63						3	5	8	473,672
64						2	3	5	308,488
65		1	2			1	6	10	559,464
66					1	1	4	6	348,924
67					1		3	4	219,962
71							2	2	115,909
72							1	1	48,364
Totals	**205**	**237**	**488**	**892**	**219**	**231**	**90**	**2,362**	**$122,591,474**

Fire Members

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll *
Under 20	1							1	$ 29,352
20-24	21	1						22	645,744
25-29	24	2	2					28	869,998
30-34	12	15	21	2				50	2,185,894
35-39	5	15	85	18				123	5,931,392
40-44	3	9	67	77	19	1		176	8,893,441
45-49		8	30	43	72	58	1	212	12,341,200
50-54			16	21	42	75	12	166	10,489,317
55-59			4	4	12	40	32	92	6,310,883
60						1		1	108,000
Totals	**66**	**50**	**225**	**165**	**145**	**175**	**45**	**871**	**$47,805,221**

@ Includes 625 members currently in the DROP.
** Valuation payroll is the greater of the current year and prior year reported pay .*

TOTAL ACTIVE MEMBERS JUNE 30, 2014
BY ATTAINED AGE AND YEARS OF SERVICE @

Attained Age	Years of Service to Valuation Date 0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	Totals No.	Valuation Payroll *
Under 20	3							3	$ 88,056
20-24	76	1						77	2,404,149
25-29	102	43	2					147	5,634,902
30-34	47	109	92	4				252	11,633,052
35-39	23	69	273	174	1			540	26,812,030
40-44	10	36	203	484	64	2		799	41,572,684
45-49	6	22	86	266	174	89	1	644	35,727,750
50-54	4	4	42	101	87	174	16	428	25,087,752
55-59		2	11	28	33	115	60	249	15,820,042
60			1		3	8	12	24	1,520,729
61						7	12	19	1,167,313
62			1			4	10	15	853,453
63						3	5	8	473,672
64						2	3	5	308,488
65		1	2			1	6	10	559,464
66					1	1	4	6	348,924
67					1		3	4	219,962
68									
69									
70									
71							2	2	115,909
72							1	1	48,364
73									
74									
75									
Totals	**271**	**287**	**713**	**1,057**	**364**	**406**	**135**	**3,233**	**$170,396,695**

@ *Includes 625 members currently in the DROP.*
* *Valuation payroll is the greater of the current year and prior year reported pay.*

	Group Averages Police	Fire	Total
Age:	42.9 years	44.5 years	43.4 years
Service:	16.3 years	18.2 years	16.8 years
Annual Pay:	$51,902	$54,885	$52,705

RECONCILIATION OF REPORTED DATA AS OF JUNE 30, 2014

Active Data

A)	Number reported in PF_Benefits table:	3,525
B)	Number reported as inactive (status = F):	(292)
C)	Records not reported with active status (based on Employee Master Table):	(26)
D)	Reported as active and retired:	(20)
E)	Members retired/terminated vested after 6/30/2014 and not reported in 2014 active data (valued using 2013 active data):	46
F)	Number of defective records:	-
G)	Number of records valued:	3,233

Retired Data

A)	Number of records reported on data file #:	39,999
B)	Number not in P/F plan #:	25,181
C)	Number not currently in receipt:	5,798
D)	Records in DROP:	625
E)	Number of defective records:	-
F)	Number valued:	8,395

Deferred Data

A)	Number of records reported on data file:	292
B)	Number of records with reported service less than 8 years:	20
C)	Number defective:	-
D)	Number valued:	272

For retiree data, file contains members in Police and Fire Retirement System and General Retirement System.

APPENDIX

SUMMARY OF ASSUMPTIONS USED FOR DPFRS ACTUARIAL VALUATION
ASSUMPTIONS ADOPTED BY BOARD OF TRUSTEES
AFTER CONSULTING WITH ACTUARY

ASSUMPTION REVIEW

All assumptions are estimates of future experience except as noted. The rationale for the assumptions is based on experience studies as noted.

ECONOMIC ASSUMPTIONS

The investment return rate used in the valuation was 6.75% per year, compounded annually (net after investment and administrative expenses). This assumption is prescribed by the Eighth Amended Plan for the Adjustment of Debts of the City of Detroit (POA).

NON-ECONOMIC ASSUMPTIONS

The mortality table used to measure retired life mortality is the RP-2014 Blue Collar Annuitant Table for males and females. Tables were extended below age 50 with a cubic spline to the published Juvenile rates. Pre-retirement mortality is the RP-2014 Blue Collar Employee Tables for males and females. The tables are projected to be fully generational, based on the 2-dimensional, sex distinct mortality improvement scale MP-2014 (which was published and intended to be used with RP-2014). This table was first used as of June 30, 2014. The rationale for the mortality assumption is based on the 2008-2013 Mortality Experience Study issued February 13, 2015.

The probabilities of age/service retirement for members eligible to retire are shown on page 26. The rationale is based on the 2002-2007 Experience Study. However, probabilities were modified effective with the June 30, 2014 valuation to reflect a change in the modeling of the future DROP members, consistent with the plan closure. The revised probabilities were selected so that, when combined with the model change, the effect on the present value of benefits would be immaterial.

The probabilities of separation from service (including *death-in-service*) are shown for sample ages on page 27. These probabilities were first used for the June 30, 2008 valuation. The rationale is based on the 2002-2007 Experience Study.

MISCELLANEOUS AND TECHNICAL ASSUMPTIONS
JUNE 30, 2014

Marriage Assumption:	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. This assumption accounts for potential dependent children/dependent parent death benefits. No other assumption is made for surviving children/dependent parents. Male spouses are assumed to be three years older than female spouses.
Pay Increase Timing:	End of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts paid to members during the year beginning the day after the valuation date.
Decrement Timing:	Decrements are assumed to occur mid-year.
Eligibility Testing:	Eligibility for benefits is determined based upon the age nearest birthday and service nearest whole year on the date of decrement.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal do not operate during retirement eligibility.
Incidence of Contributions:	Employer contributions are assumed to be received on the last day of the fiscal year.
Longevity in AFC:	Longevity payments were included directly in the AFC data provided by the System. No further adjustment was included.
Unused Sick Leave Payout:	Sick leave banks as of June 30, 2014 were included in data provided by the System. No further adjustment was included.
Administrative Expense:	The investment return assumption is mandated to be net of administrative expense in the plan document. No other provision for administrative expenses is included in this valuation.
Post-Retirement COLA:	Active members are assumed to receive a 0.9% COLA rather than 1.0125% because the annuity portion is not subject to the COLA. Post retirement increases for retired members were based on the plan in effect at retirement. For the pre-69 plan members, future COLA's are assumed to be the same as wage inflation for active members. The COLA rate is prorated by the ratio of COLA eligible service to total service at retirement.
AFC Period:	AFC data was provided by the System.
Disability Change Age:	The duty disability benefit is assumed to change at normal retirement age.

MISCELLANEOUS AND TECHNICAL ASSUMPTIONS
JUNE 30, 2014
(CONTINUED)

DROP Assumption:	All active members not in the DROP are assumed to have a 40% chance of retiring or entering the DROP in their first five years of retirement eligibility with a 60% chance of entering the DROP.
Workers Compensation Offset:	No Workers compensation offsets are assumed for duty disability benefits.
DROP Account:	DROP account balances are not reported. No liability is included for DROP account balances.
Class Codes:	For valuation purposes, members are categorized as DPOA, DFFA or LSA based on class codes provided by the Retirement System and are primarily used in the valuation to determine normal retirement eligibility (20 & Out versus 25 & Out). Therefore, counts in the valuation may not represent actual membership in the respective associations.
Retiree Benefit Estimate:	Reported retiree benefits as of June 30, 2014 were adjusted to include the effect of the COLA reduction from 2.25% to 1.0125%, effective March 2015 as administered.
Frozen Benefit Estimate:	Reported AFC as of June 30, 2014 was adjusted to include 25% of unused sick leave (to a maximum of 25 days per year of service) plus a load of 6% for data consistency with sample actual computations.
Form of Payment:	The actuarial equivalent basis for optional forms of payment and early retirement are based on the 1971 Group Annuity Mortality table projected to 1984, a 7.8% interest rate and a 0% COLA assumption. Annuity withdrawal factors use the same mortality and COLA assumptions with a 5% interest rate. No adjustment has been made for alternate forms of payment elections. Principle balances of accumulated member contributions were converted to life annuity offsets based on plan factors for the valuation.

The rationale for the miscellaneous and technical assumptions is the 2002-2007 Experience Study, modified as necessary for changes in data or administration.

FUNDING METHODS

The unit credit cost method was used in determining age and service liabilities and normal cost, vesting liabilities, and casualty pension liabilities. Under this method, there is no normal cost since benefits are frozen and there are no future accruals and actuarial accrued liability is the present value of each individual's accrued benefit..

Unfunded Actuarial Accrued Liabilities. Actual employer contributions through June 30, 2023 are set by the POA. The amortization period and method after 2023 has not yet been established by the Board.

Employer contribution dollars were assumed to be *paid in a single sum on the last day* of the employer fiscal year. (Adopted for the June30, 1979 actuarial valuation.)

Present assets are set equal to the Market Value.

The data about persons now covered and about present assets was furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the actuary.

SINGLE LIFE RETIREMENT VALUES BASED ON RP-2014 BLUE COLLAR FOR MALES AND FEMALES

Sample Attained Ages	Future Life Expectancy (years)	
	Men	Women
45	39.15	42.53
50	34.17	37.47
55	29.40	32.57
60	24.86	27.80
65	20.53	23.20
70	16.49	18.83
75	12.79	14.82
80	9.53	11.24

PROBABILITIES OF SERVICE RETIREMENT

	Percent of Eligible Active Members Retiring Within Next Year			
	Police		Fire	
Service	20&Out	25 &Out	20&Out	25 &Out
19	40%		40%	
20	40%		40%	
21	40%		40%	
22	40%		40%	
23	40%		40%	
24	100%	40%	100%	40%
25	100%	40%	100%	40%
26	100%	40%	100%	40%
27	100%	40%	100%	40%
28	100%	40%	100%	40%
29	100%	100%	100%	100%
30	100%	100%	100%	100%
31	100%	100%	100%	100%
32	100%	100%	100%	100%
33	100%	100%	100%	100%
34	100%	100%	100%	100%
35	100%	100%	100%	100%
36	100%	100%	100%	100%
37	100%	100%	100%	100%
38	100%	100%	100%	100%
39	100%	100%	100%	100%
40	100%	100%	100%	100%
Ref	922	922	922	922

	Percent of Eligible Active Members Retiring Within Next Year	
Age	Police	Fire
60	40%	100%
61	40%	100%
62	40%	100%
63	40%	100%
64	40%	100%
65	100%	100%
66	100%	100%
67	100%	100%
68	100%	100%
69	100%	100%
70	100%	100%
Ref	922	1

Members eligible for 20 & Out are assumed to be first eligible for normal retirement after 19 years of service due to their ability to purchase service. Members eligible for 25 & Out are assumed to be eligible for normal retirement after 24 years of service due to their ability to purchase service. Members are also eligible to retire at age 60 with no service requirement. The rationale is the 2002-2007 Experience Study.

PROBABILITIES OF SEPARATION

Sample Ages	Years of Service	% of Active Members Withdrawing within Next Year	
		Police	Fire
ALL	0	8.50%	5.00%
	1	7.50%	4.00%
	2	6.00%	3.00%
	3	5.00%	2.00%
	4	4.50%	2.00%
25	5 & Over	4.50%	1.96%
30		3.30%	1.62%
35		2.30%	1.11%
40		1.70%	0.77%
45		1.50%	0.60%
50		1.10%	0.51%
55		0.80%	0.51%
60		0.80%	0.51%
Ref		566	230
		207	113 x .85

Sample Ages	% of Active Members Becoming Disabled within Next Year			
	Police		Fire	
	Ordinary	Duty	Ordinary	Duty
25	0.06%	0.13%	0.07%	0.34%
30	0.07%	0.19%	0.08%	0.52%
35	0.08%	0.34%	0.09%	0.90%
40	0.11%	0.49%	0.12%	1.30%
45	0.16%	0.73%	0.18%	1.92%
50	0.47%	1.16%	0.53%	3.06%
55	0.73%	1.96%	0.82%	5.18%
60	0.83%	2.82%	0.94%	7.47%
Ref	105 x 0.75	90 x 0.85	105 x 0.85	90 x 2.25

The rationale is the 2002-2007 Experience Study.

GLOSSARY

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability."

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Actuarial Assumptions. Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

Actuarial Cost Method. A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

Actuarial Equivalent. A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

AFC. Average final compensation

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

Contribution Budgeting Liability. An expected return based measure of pension obligation.

DPOA. Detroit Police Officers Association

DFFA. Detroit Fire Fighters Association

DPCOA. Detroit Police Command Officers Association

DROP. Deferred Retirement Option Program

Experience Gain (Loss). A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

LSA. Lieutenants and Sergeants Association

Normal Cost. The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost." Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

POA. The 8^{th} Amended Plan for the Adjustment of the Debt of the City of Detroit.

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

Solvency Liability. A market-based measure of the present value of accrued benefits at a municipal bond discount rate unadjusted for the credit quality of the plan sponsor.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability."

Valuation Assets. The value of current plan assets recognized for valuation purposes.

GRS
Gabriel Roeder Smith & Company
Consultants & Actuaries
One Towne Square
Suite 800
Southfield, MI 48076-3723
248.799.9000 phone
248.799.9020 fax
www.gabrielroeder.com

November 25, 2015

Mr. David Cetlinski
Executive Secretary
The Police and Fire Retirement System of the
City of Detroit
One Detroit Center
500 Woodward Avenue, Suite 3000
Detroit, MI 48226

Re: June 30, 2014 Actuarial Valuation

Dear Dave:

Enclosed are 42 copies of the report of the June 30, 2014 annual actuarial valuation.

Sincerely,

Kenneth G. Alberts

KGA:mrb
Enclosures

cc: Cynthia Thomas, City of Detroit Retirement Systems
Deborah A. Wilkerson
David T. Kausch, GRS
Judith A. Kermans, GRS
Brian B. Murphy, GRS