City of Detroit Employees Death Benefit Plan

Annual Actuarial Valuation Report

June 30, 2018

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April 24, 2019

Governing Board
City of Detroit
Employees Death Benefit Plan
Detroit, Michigan

Dear Board Members:

The results of the **Annual Actuarial Valuation** of the liabilities for benefits provided by the City of Detroit Employees Death Benefit Plan are presented in this report. The purpose of the valuation was to measure the Plan's funding progress for the year ending June 30, 2018 and to establish the employer contribution for the period ending June 30, 2020, based on the Board's funding policy. The results of the valuation may not be applicable for other purposes. In particular, information in this study is not suitable for reporting requirements under GASB Statement Nos. 74 or 75. GASB calculations are contained in a separate report.

Contribution determinations based on the Board's funding policy shown in this report are for the Open group. The employer no longer has an obligation to fund benefits for the Closed group. The Board previously bifurcated the assets between the two groups and then offered a cash-out option to Closed group members. No additional employer contributions will be made to the Closed Plan. Benefits will be paid to Closed Plan members only to the extent assets are available. The window period for the cash-out option ended before the valuation date. See the Comments on pages A-7 and A-8 for further details of the Closed Plan.

The date of the valuation was **June 30, 2018**.

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 Plan staff concerning active members, retirees and beneficiaries, and Trust assets as of the valuation date. We checked for year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by Plan staff.

Your attention is directed particularly to the Comments section starting on page A-7 and the contribution amounts on page A-3. The contribution amounts are the amounts determined based on the City Ordinance and Board Policy. Users of this report should be aware that such contributions do not guarantee benefit security. We suggest the Board consider benefit security when adopting contribution amounts and remind the Board that they are free to adopt higher contributions than presented herein.

This report has been prepared by individuals who have substantial experience valuing public sector benefit programs. 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 individuals 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.

The assumptions used in the valuation concerning future experience are summarized in Section C of this report. The actuarial assumptions used for the valuation are set by the Board based upon advice of the actuary and other parties and are therefore a "prescribed assumption set by another party" as discussed in Actuarial Standards of Practice. In our judgement, all of the actuarial assumptions used for the valuation are reasonable for purposes of the measurement being taken.

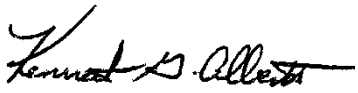
Unfunded Accrued Liabilities shown in this report do not include any unfunded amounts for the Closed Plan, unless specifically labeled otherwise.

A determination regarding the ability of the plan sponsor to make contributions when due is outside the scope of the assignment, outside our area of expertise and was, therefore, not performed.

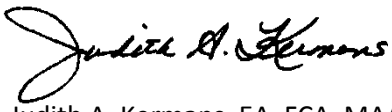
This report was prepared at the request of the Governing Board of the City of Detroit Employees Death Benefit Plan and their staff and is intended for their use. This report may be supplied to other parties but only with the permission of the Board and only in its entirety. GRS is not responsible for unauthorized use of this report. The authors of this report are available to answer questions from the Board and staff as needed.

Respectfully submitted,

David T. Kausch, FSA, EA, MAAA, FCA, PhD



Kenneth G. Alberts



Judith A. Kermans, EA, FCA, MAAA

DTK:sc

SECTION A

VALUATION RESULTS

Executive Summary

Valuation Date	June 30, 2018	June 30, 2017
Contributions for Fiscal Year Ending	June 30, 2020	June 30, 2019
Number of		
Active Members		
LSA and Fire Equivalent	639	643
Other	7,565	6,997
Total	8,204	7,640
Retirees and Beneficiaries (Including DROP)	1,976	1,665
Inactive, Nonretired Members	-	-
Total	10,180	9,305
Required Employer Contributions		
LSA and Fire Equivalents[#]	$ 20.70	$ 20.70
Other[#]	$ 13.30	$ 13.30
Average Annual Amount Per Active Member	$ 13.88	$ 13.92
Estimated Employer Contribution	$ 113,842	$ 106,370
Assets		
Market Value (without future retired/employee contributions)	$ 3,955,799	$ 3,893,653
Actuarial Value (without future retired/employee contributions)	$ 3,924,153	$ 3,963,739
Actuarial Value (with future retired/employee contributions)	$ 3,982,361	$ 4,018,065
Return on Market value - (net of investment and administrative expenses)	8.0%	8.3%
Ratio - Actuarial Value to Market Value	99.2%	101.8%
Return on Actuarial Value of Assets	5.1%	3.0%
Actuarial Information		
Employer Normal Cost per Active Member $	$ 4.26	$ 3.92
Actuarial Accrued Liability (AAL)	$ 4,007,192	$ 3,687,234
Unfunded Actuarial Accrued Liability (UAAL)	24,831	(330,831)
Funded Ratio	99.4%	109.0%

Highlights/Changes

No changes to benefit provisions

No changes to actuarial assumption and methods

The aggregate experience gain/loss was a loss of approximately $253,000

Assets reported for June 30, 2017 included non-trust assets. These assets were excluded from the June 30, 2018 reported assets. This resulted in a decrease of $222,000 to the open plan assets.

The executive summary gives an overview of the entire report. It cannot be used as a substitute for a thorough reading of the full report.

 # Annual per ordinance

Funding Objective

The funding objective of the Death Benefit Plan has been to establish and receive level dollar contributions which will accumulate sufficient reserves during each member's working lifetime to pay pre and post retirement death benefits.

Contribution Rates

The Death Benefit Plan is supported by member contributions (active and retired), City contributions and investment income from Plan assets. Active member and City contributions are only used to fund Open group member benefits.

City contributions for the open plan which satisfy the funding objective are determined by the annual actuarial valuation and are sufficient to:

(1) Cover the actuarial present value of benefits allocated to the current year by the actuarial cost method described in Section C (the normal cost); and

(2) Finance over a period of future years the actuarial present value of benefits not covered by valuation assets and anticipated future normal costs (unfunded actuarial accrued liability).

We understand the Board funding policy is to set employer contributions equal to the greater of:

1) Normal cost plus a 30-year amortization of unfunded actuarial accrued liability on a per active person basis; and
2) The per active person rates specified in the ordinance.

Computed contribution amounts are shown on page A-3.

Contributions to Provide Death Benefits
Determined as of June 30, 2018 (Open Plan Only)

Annual Per Member Contributions for	Fiscal Year Ending June 30, 2020
Normal Cost of Benefits:	
A. Age & service retirement death benefits	$ 6.95
B. Pre-retirement death benefits	6.35
C. Disability retirement death benefits	1.56
D. Total Normal Cost (A+B+C)	$ 14.86
E. Average Employee Contributions	10.60
F. Employer Normal Cost (D-E)	$ 4.26
G. Unfunded Actuarial Accrued Liabilities[#]	0.24
H. Total Computed Contributions (D+G)	15.10
Total Computed Employer	
I. **Contribution Per Member (H-E)**	$ 4.50
J. **Average Contributions Per Ordinance**	$ 13.88
K. **Additional Contributions Needed (I-J, not less than zero)**	$ 0.00
L. **Number of Active Members**	8,204
M. **Estimated Total Employer Contribution Dollars (L times the Greater of I and J)**	$113,842

 # The Open group is 99% funded as of June 30, 2018. The actuarially determined contributions are below the Ordinance Rate.

Amounts shown are for the open group only and are based on the Board's funding policy of amortizing any UAAL over a 30-year period, and setting the rates in the ordinance as a minimum. Ordinance states employer contributes $13.30 annually per active member ($20.70 for LSA), while active members each contribute $10.40 annually ($13.00 for LSA).

A determination regarding the ability of the plan sponsor to make contributions when due is outside the scope of the assignment, outside our area of expertise and was, therefore, not performed.

Summary Statement of System Resources and Obligations (Open Plan Only)

Present Resources and Expected Future Resources

A. Present valuation assets:	
1. Net open plan assets from System financial statements (Market Value)	$3,955,799
2. Market adjustment	(31,646)
3. Open Plan funding value of assets	3,924,153
4. Present value of future retiree contributions	58,208
5. Open Plan valuation assets applied	3,982,361
B. Actuarial present value of expected future member and employer contributions:	
1. For normal costs	654,159
2. For unfunded actuarial accrued liability	24,831
3. Total	678,990
C. Total Present and Expected Future Resources: @	$4,661,351

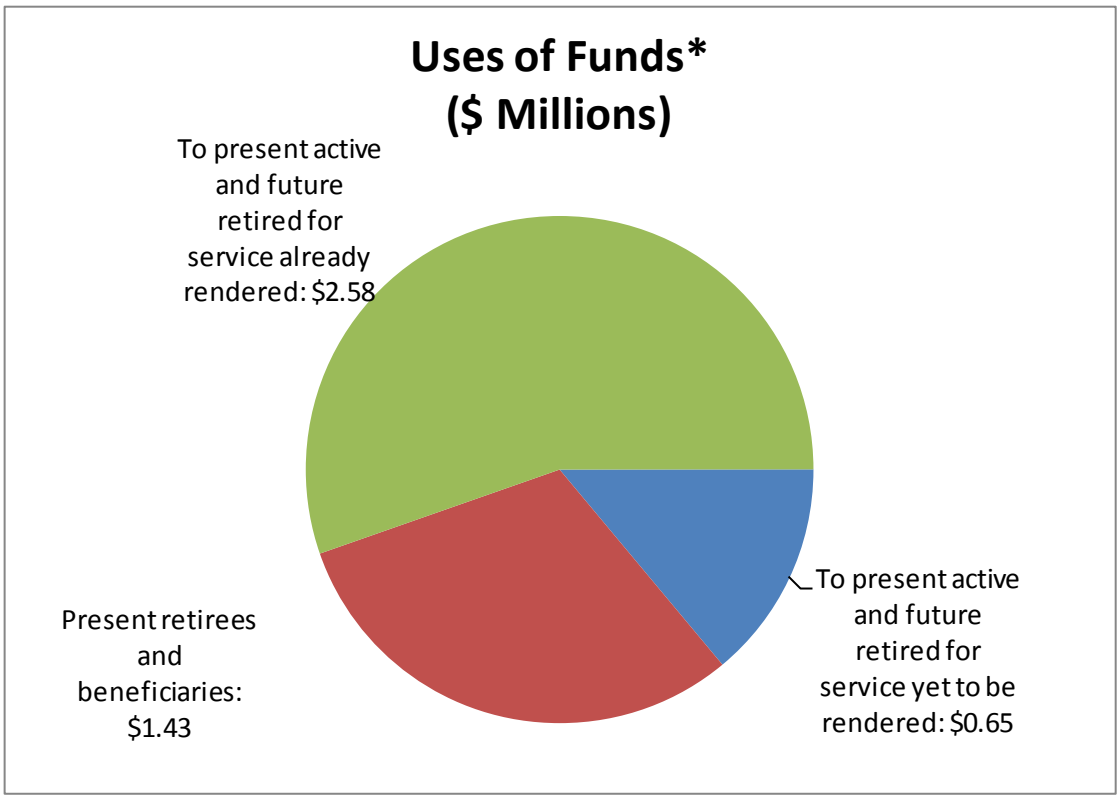
Actuarial Present Value of Expected Future Death Benefit Payments

A. To retirees and beneficiaries:	
1. Death Benefits	$1,430,898
2. Reserve	0
3. Total	1,430,898
B. To vested terminated members:	0
C. To present active members:	
1. Allocated to service rendered prior to valuation date - actuarial accrued liability	2,576,294
2. Allocated to service likely to be rendered after valuation date	654,159
3. Total	3,230,453
D. Total Actuarial Present Value of Expected Future Benefit Payments: @	$4,661,351

@ Excludes accrued liabilities and assets for Closed group members.

Financing Benefit Promises
June 30, 2018 (Open Plan Only)

($4.66 Million)



* *Totals may not add due to rounding.*

Historical Schedule of Open Plan Results
June 30, 2018 (Open Plan Only)

Valuation Year June 30	(1) MVA	(2) Funding Valuation Adjustment	(3) Present Value of Future Retiree	(4) (1) + (2) + (3) Funding Valuation Assets	(5) Actuarial Accrued Liability	(6) (5)-(4) Unfunded Actuarial Accrued Liability	(7) Funded Status (4)/(5) Funding Valuation Assets	(7) Funded Status (1)/(5) Market Value of Assets	(8) Fiscal Year June 30,	(9) Per Active Employer Rate
2015	$ 3,706,850	$ 51,896	$ 49,559	$ 3,808,305	$ 3,558,464	$ (249,841)	107%	104%	2017	14.02
2016	3,701,238	251,684	49,471	4,002,393	3,292,916	(709,477)	122%	112%	2018	13.96
2017	3,893,653	70,086	54,326	4,018,065	3,687,234	(330,831)	109%	106%	2019	13.92
2018*	3,955,799	(31,646)	58,208	3,982,361	4,007,192	24,831	99%	99%	2020	13.88

** After corrected assets, removing non-trust assets.*

Comments

Comment A – Experience

Activity during the year for the Open Plan was less favorable than expected resulting in an experience loss of approximately $253 thousand (or 7% of beginning of year liabilities) for the Open Plan. The primary sources of the experience loss were data-related, including rehires with more than 1 year of service and an increase in active members as well as new retirees entering the plan from deferred vested status. These losses are in addition to investment losses and a beginning of year asset adjustment of $(221,948). The allocation of administrative expenses amplified the asset loss in the Open Plan.

Comment B – Assumptions

There have been no assumption changes since the June 30, 2015 Employee's Death Benefit valuation. The assumed rate of return of 7.0%, net of expenses, is based on the investment allocation of the pooled assets of the Open and Closed Plans. We recommend reviewing the assumed rate of return in conjunction with changes to asset allocation.

Comment C – Methods

This valuation was conducted assuming that the Open Plan would continue to receive employer contributions.

The contributions provided in the City Ordinance are currently greater than necessary to fund benefits for the Open Plan, based on the current assumptions.

Comment D – Future Outlook

The Open Plan funding value of assets is lower than the market value of assets by $31 thousand due to investment activity better than assumed in 2018. As these gains are recognized during FY 2019 and FY 2020, the funded status of the Plan is expected to increase if all assumptions are met.

Comment E – Active Members

Because potential active death benefits are so large compared to post retirement death benefits (potential active death benefits account for approximately 40% of the total normal cost), large changes in active member counts can result in large changes in the funded status. The table below shows how these two statistics compare:

Valuation Date	6/30/2016	6/30/2017	6/30/2018
Active Members Covered	6,718	7,640	8,204
Funded Ratio	121.5%	109.0%	99.4%

If there is a large growth in the covered active membership in future valuations, there will be downward pressure on the funded status of the Plan, especially if that growth comes from re-hires (members with past service).

Comments

Comment F – Closed Plan

Based on the census data reported for the June 30, 2018 valuation, we have estimated the funded status of the Closed Plan as follows:

June 30, 2018	Closed Plan
Return Assumption	**4.29%**
Actuarial Accrued Liabilities	$ 19,568,558
Expected Future Retiree Contributions	(119,134)
Reported Market Value of Assets	$ (20,509,869)
Unfunded Actuarial Accrued Liabilities	$ (1,060,445)
Funded Status	105.45%

An investment return assumption of 4.29% was used to develop the schedule above since it is the assumption adopted by the Board for purposes of the cash-out option. If the Board would like to see the results based on a different rate, please let us know and we can perform such supplemental calculations. The cash-out option is reflected in the amounts above.

Note, the plan provisions of the Open and Closed Plans are the same. However, there are no active members in the Closed Plan. Benefits are payable to Closed Plan members only to the extent that assets are available. If the Board wishes to review the investment policy for the Open and Closed Plans, we can provide projected cash flows upon request.

Comment G – Open Plan Funded Status

The Open Plan is currently 99% funded using the actuarial value of assets (and including the present value of future retired member contributions). The Open Plan is 99% funded using the market value of assets (excluding the present value of future retired member contributions). The funded status of the Plan is appropriate for assessing the need for future contributions for benefits attributable to past service if all assumptions are met. This funded status is not an appropriate measure of the Plan's future need for contributions attributable to service rendered after the valuation date or to measure the estimated settlement costs.

Other Observations

General Implications of Contribution Allocation Procedure or Funding Policy on Future Expected Plan Contributions and Funded Status

Given the plan's contribution allocation procedure, if all actuarial assumptions are met (including the assumption of the plan earning 7.00% on the actuarial value of assets), it is expected that:

1) The funded status of the plan will become 100% funded and remain above 100% funded.
2) The employer contributions called for in the Ordinance will continue to exceed the actuarially determined employer contribution.

Limitations of Funded Status Measurements

Unless otherwise indicated, a funded status measurement presented in this report is based upon the actuarial accrued liability and the actuarial value of assets. With regard to any funded status measurements presented in this report:

1) The measurement is inappropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations, in other words, of transferring the obligations to an unrelated third party in an arm's length market value type transaction.
2) The measurement is dependent upon the actuarial cost method which, in combination with the plan's amortization policy, affects the timing and amounts of future contributions. A funded status measurement in this report of 100% is not synonymous with no required future contributions. If the funded status were 100%, the plan would still require future normal cost contributions (i.e., contributions to cover the cost of the active membership accruing an additional year of service credit). Board policy is to develop an employer contribution that is the larger of 1) the per active person rate in the ordinance; or 2) the per active person rate necessary to pay normal cost plus a UAAL payment based on a 30-year amortization period.

Limitations of Project Scope

Actuarial standards do not require the actuary to evaluate the ability of the plan sponsor or other contributing entities to make required contributions to the plan when due. Such an evaluation was not within the scope of this project and is not within the actuary's domain of expertise. Consequently, the actuary performed no such evaluation.

Risks to Future Employer Contribution Requirements

There are ongoing risks to future employer contribution requirements to which the Retirement System is exposed, such as:

- Actual and Assumed Investment Rate of Return
- Actual and Assumed Mortality Rates
- Amortization Policy
- Changing Active Member Count

Experience Gain (Loss) Analysis
June 30, 2018

(1)	UAAL* beginning of year	$ (330,831)
(2)	Normal cost	111,086
(3)	Contributions made	203,964
(4)	Interest accrual: 0.07 x [(1) + 1/2 [(2) - (3)]]	(26,409)
(5)	Expected UAAL before changes: (1) + (2) - (3) + (4)	(450,118)
(6)	Effect of assumption/method changes	0
(7)	Effect of asset changes	221,948
(8)	Expected UAAL after changes: (5) + (6) + (7)	(228,170)
(9)	Actual UAAL end of year	24,831
(10)	Gain/(Loss): (8) - (9)	**$ (253,001)**
	(10a) Portion of gain/(loss) due to investments	(107,060)
	(10b) Portion of gain/(loss) due to liabilities	(145,941)
(11)	Total Gain/(Loss) as a percent of beginning of year accrued liabilities	**(6.9%)**

* *Unfunded Actuarial Accrued Liability.*

Type of Risk Area	Gain (Loss) in Period # Totals	Percent of Beginning of Year Liabilities
Investment Return	$ (107,060)	(2.9)%
New Hires with more than 1 year of service	(86,008)	(2.3)%
New Hires with 1 or less years of service	(12,099)	(0.3)%
Other Data Adjustments *	(102,056)	(2.8)%
Demographic Risk Areas:		
Full and Reduced Service Retirements	$ (18,232)	(0.5)%
Disability Benefits	1,077	0.0 %
Other Terminations	100,379	2.7 %
Active Totals	$ 83,225	2.3 %
Mortality (including pre-retirement)	(29,003)	(0.8)%
Total Gain (or Loss) During Period	$ (253,001)	(6.9)%

 # Results are approximate due to limitations in data.

** Related to data audits and more precise reporting by the System.*

SECTION B

DATA USED IN VALUATION

Summary of Benefit Provisions and Contributions
June 30, 2018 (Open Plan Only)

Group	Amounts
Active Members	
Lump Sum Death Benefit:	
While Active	
- Police & Fire (Lieutenants and Sergeants Association (LSA) & Fire equivalents)	$10,000
- Police & Fire (All Others)	$ 4,900
- Civilian members	$10,000
After Retirement:	
With 8-10 years service	$1,860
With 10 or more years service	$1,860 plus $93 per year of service in excess of 10 years
Contributions:	
Members (non-refundable)	$10.40/year*
Employer	$13.30/year*
Retired Employees	
Lump Sum Death Benefit:	$1,860 plus $93 per year of service in excess of 10 years
Contributions:	
Retired members	$1.08/year
Employer	None
Other	
People in the Deferred Retirement Option Plan (DROP) are treated like any other retired member for purposes of this plan.	
People who terminate active service prior to retirement are not normally eligible for plan benefits. We understand that there are exceptions to this rule for former police officers and firefighters. We have made no adjustment to the valuation for exceptions.	

* *Contributions for Police Lieutenants and Sergeants and Fire equivalents (approximately 639 members) are $13.00/yr. for members and $20.70/yr. for City.*

Comparative Statement
Open Plan Only

June 30	Covered Members				Fiscal Year June 30	Active Member & Employer Contributions	
	Active			Retired		Greater of Ordinance or Computed	Actual@
	General	Police & Fire	Total				
2014#^	4,757	3,183	7,940	0	2016	24.83	21.85
2015#	4,981	2,484	7,465	749	2017	24.68	25.14
2016	4,235	2,483	6,718	1,239	2018	24.59	26.70
2017	5,117	2,523	7,640	1,665	2019	24.54	
2018	5,629	2,575	8,204	1,976	2020	24.48	

 # After revised actuarial assumptions or methods.
@ Weighted average based on actual contributions and beginning of fiscal year head count.
^ Excludes 174 actives retired by 12/31/2014 and 16,857 retirees transferred to Closed Plan. Plan is bifurcated effective 12/10/2014.

Schedule of Employer Contributions

Year Ending June 30	Estimated	Actual	Excess/ (Shortfall)	Actual/ Expected
2016	$ 112,272	$ 95,213	$ (17,059)	85%
2017	104,659	88,709	(15,950)	85%
2018	93,797	107,627	13,830	115%
2019	106,370			
2020	113,842			

Demographic Information
Open Plan Only

Active Age and Service Schedule

Attained Age	Years of Service to Valuation Date							Totals
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.
Under 20	78							78
20-24	508	2						510
25-29	869	22	2					893
30-34	593	90	47	2				732
35-39	416	78	122	161	1			778
40-44	328	71	120	373	116	2		1,010
45-49	342	70	101	422	351	51	2	1,339
50-54	286	60	72	248	296	117	66	1,145
55-59	195	46	70	166	200	132	139	948
60-64	125	31	49	79	91	74	107	556
65-69	43	17	18	19	15	8	27	147
70-74	13	6	4	4	7	3	8	45
75-79	3	2	4	6	1	2	5	23
Totals	**3,799**	**495**	**609**	**1,480**	**1,078**	**389**	**354**	**8,204**

Demographic Information
Open and Closed Groups

Retiree Age and Service Schedule (Open)

Attained Age	Years of Service as Reported in Valuation										Totals
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-50	50 Plus	No.
Under 20	0	0	1	0	2	0	0	0	0	0	0	3
20-24	0	0	0	1	1	0	0	0	0	0	0	2
25-29	0	0	0	0	0	3	0	0	0	0	0	3
30-34	0	0	0	0	0	0	0	0	0	0	0	0
35-39	0	2	3	4	2	2	0	0	0	0	0	13
40-44	0	1	7	77	7	2	0	0	0	0	0	94
45-49	0	0	3	116	91	39	1	1	3	7	1	262
50-54	0	1	5	64	118	176	6	1	5	10	3	389
55-59	0	0	7	40	96	220	14	1	3	8	3	392
60-64	0	6	108	126	103	207	47	7	1	4	1	610
65-69	0	4	41	34	17	39	16	9	1	0	0	161
70-74	0	2	3	6	7	9	3	1	5	0	0	36
75-79	0	0	0	4	1	0	0	2	0	0	0	7
80-84	0	0	1	0	0	1	1	0	0	0	1	4
85-89	0	0	0	0	0	0	0	0	0	0	0	0
90-94	0	0	0	0	0	0	0	0	0	0	0	0
Totals	**0**	**16**	**179**	**472**	**445**	**698**	**88**	**22**	**18**	**29**	**9**	**1,976**

Retiree Age and Service Schedule (Closed)

Attained Age	Years of Service as Reported in Valuation										Totals
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-50	50 Plus	No.
Under 20	0	0	0	0	0	0	0	0	0	0	0	0
20-24	0	0	0	0	0	1	0	0	0	0	0	1
25-29	0	0	0	0	0	1	0	0	0	0	0	1
30-34	0	0	0	0	0	0	0	0	0	0	0	0
35-39	0	5	25	1	0	5	0	0	0	0	0	36
40-44	0	2	39	14	2	3	0	0	0	0	0	60
45-49	0	2	49	55	44	20	1	0	0	0	0	171
50-54	0	4	43	50	103	199	7	1	0	1	0	408
55-59	0	5	65	58	85	450	125	5	0	0	0	793
60-64	0	16	105	122	175	616	417	28	1	1	1	1,482
65-69	0	28	231	226	251	861	593	126	9	1	0	2,326
70-74	0	35	199	221	201	763	532	191	22	2	0	2,166
75-79	0	29	122	140	133	439	333	105	16	4	1	1,322
80-84	0	22	63	61	76	205	193	53	15	6	1	695
85-89	0	10	38	45	54	126	155	87	9	1	3	528
90-94	0	9	24	28	49	107	112	48	12	3	0	392
95-99	0	4	7	11	8	31	34	9	6	1	1	112
100-104	0	1	0	1	1	3	4	0	0	0	0	10
105-109	0	0	0	1	0	1	0	0	0	0	0	2
110-114	0	0	0	0	0	1	0	0	0	0	0	1
115-119	0	0	0	0	0	1	0	0	0	0	0	1
Totals	**0**	**172**	**1,010**	**1,034**	**1,182**	**3,833**	**2,506**	**653**	**90**	**20**	**7**	**10,507**

Data Adjustments

Source of Data Used for This Valuation

The active member data used for this valuation is the same data that was used for the valuations of the General Retirement System and Police and Fire Retirement System pension plans. The retiree data used for this valuation is based on the data used for the General Retirement System and Police and Fire Retirement System pension plans with the following adjustments:

- Members in the retiree data listed as survivors or dependent children were not included in this valuation.
- Members that retired in 2014 or prior were valued in the Closed Plan only.
- A data file containing a list of Closed Plan members that elected to cash-out their death benefit was provided. The members in that data file were not valued in the Closed Plan.

Concerns and Deficiencies of the Data Used

People who terminate active service prior to retirement are not normally eligible for plan benefits. We understand that there are exceptions to this rule for former police officers and firefighters. The exceptions are not explicitly identified and we assume that all terminated members are not eligible for the death benefit. Furthermore, in the retiree data we are unable to distinguish members that terminated prior to retirement. We are, therefore, unable to exclude those members from this valuation.

We have been instructed by System staff to use bargaining unit information to determine membership in DPLSA and DPCOA. Historically, the class code was used for this purpose but it no longer applies under the new Component I pension plans. Class code information from the 2014 valuation is brought forward each year and is used to determine DPLSA and DPCOA (and Fire equivalents) membership as defined in Component II as of June 30, 2014 for purposes of the retirement assumption. In particular, for members older than 43 or with more than 17 years of service as of June 30, 2014, individuals with DPLSA and DPCOA (and Fire equivalent) class codes were assumed to be eligible for Component II 25 & Out retirement conditions and individuals with DPOA (and Fire equivalent) class codes were assumed to be eligible for Component II 20 & Out retirement conditions.

Retiree death benefits were estimated based on service. For those retirees with less than eight years of service reported we assumed the reported service was not credible (due to vesting and retirement conditions) and used 25 years of service to estimate the death benefit. Service reported on the retiree hybrid file was capped at 4 years, then added to the service on the retiree legacy file for purposes of estimating retiree benefits.

Membership

It was assumed that all active members and all retired members of the City of Detroit Retirement Systems would participate in this Plan going forward subject to the division of the Plan under the POA. It is further assumed that current vested former police officers and firefighters will decline to participate in the Plan at retirement. Beneficiaries of deceased retired and active members were excluded from this valuation.

If readers of this report have information to indicate that the data adjustments described above are not reasonable, they should immediately inform the authors and should not rely on results of the report.

Reconciliation of Raw Data

Police and Fire Retirement System Active Data	
Number used in the June 30, 2018 pension valuation	2,575
Excluded	-
Added	-
Number of records valued in the June 30, 2018 Employees Death Benefit report	2,575
General Retirement System Active Data	
Number used in the June 30, 2018 pension valuation	5,629
Excluded	-
Added	-
Number of records valued in the June 30, 2018 Employees Death Benefit report	5,629
Police and Fire Retirement System Retiree Data	
Number used in the June 30, 2018 pension valuation (legacy and hybrid, including DROP)	9,047
Excluded (due to Closed Plan, survivor, etc.)	(8,040)
Added	-
Number of records valued in the June 30, 2018 Employees Death Benefit report	1,007
General Retirement System Retiree Data	
Number used in the June 30, 2018 pension valuation (legacy and hybrid)	11,931
Excluded (due to Closed Plan, survivor, etc.)	(10,962)
Added	-
Number of records valued in the June 30, 2018 Employees Death Benefit report	969

Summary of
Current Asset Information (Total Plan)

Assets

	June 30, 2018 Market Value
Cash & Equivalents	$ 430,463
Bonds	2,087,030
Equities	10,485,789
Mutual Funds	11,447,667
Fund Balance	$ 24,450,949
Accounts Recievable	14,719
Total Fund Balance	$ 24,465,668
Less Closed Plan Assets	(20,509,869)
Total Fund Balance - Open Plan	$ 3,955,799

Receipts and Disbursements

	Funding Value	
	2017-18	2016-17
Balance beginning of year	$ 25,818,120	$ 26,777,466
Adjustment	$ (1,479,655)	$ -
Restated balance beginning of year	$ 24,338,465	$ 26,777,466
Receipts		
Employer Contributions - Open	$ 107,627	$ 88,709
Member Contributions Active/Retired	105,865	90,451
Investment Income	1,313,677	900,838
Total	$ 1,527,169	$ 1,079,998
Disbursements		
Benefits Paid - Open	$ 184,826	$ 230,000
Benefits Paid - Closed	1,355,391	1,685,834
Other Expenses	64,002	123,510
Total	$ 1,604,219	$ 2,039,344
Total Plan Assets	**$ 24,261,415**	**$ 25,818,120**
Closed Plan Assets	$ 20,337,262	**$ 21,854,381**
Open Plan Assets	**$ 3,924,153**	**$ 3,963,739**
Ratio of Investment Return to Mean Assets	5.1%	3.0%

Summary of
Current Asset Information (Total Plan)

Development of Estimated
Market Value of Assets

	Market Value	
	2017-18	2016-17
Balance beginning of year	$ 25,356,335	$ 25,079,950
Adjustment	$ (1,479,655)	$ -
Restated balance beginning of year	$ 23,876,680	$ 25,079,950
Receipts		
Employer Contributions	$ 107,627	$ 88,709
Member Contributions	105,865	90,451
Recognized Investment Income	1,979,715	2,136,569
Total	$ 2,193,207	$ 2,315,729
Disbursements		
Benefits paid - Active (open)	$ 184,826	$ 230,000
Benefits Paid - Retired (open/closed)	1,355,391	1,685,834
Other Expenses	64,002	123,510
Total	$ 1,604,219	$ 2,039,344
Total Plan Assets	**$ 24,465,668**	**$ 25,356,335**
Closed Plan Assets	$ 20,509,869	$ 21,462,682
Open Plan Assets	$ 3,955,799	$ 3,893,653
Ratio of Investment Return to Mean Assets	8.3%	8.3%

The City provided the open and closed asset reconciliation from June 30, 2017 to June 30, 2018.

The result is shown on the next page.

Reported Allocation of Assets for Open and Closed Groups

	Open Plan	Closed Plan	Total
Allocation of Assets used in 06/30/2017 Valuation	$ 3,893,653	$ 21,462,682	$ 25,356,335
Adjustment Made to Exclude Non-Trust Assets	(221,948)	(1,257,707)	(1,479,655)
Adjusted Allocation of Assets as of 06/30/2017 for Valuation	$ 3,671,705	$ 20,204,975	$ 23,876,680
Receipts			
Employer Contributions	$ 107,627	$ -	$ 107,627
Employee and Retiree Contributions	96,337	9,528	105,865
Investment income	296,957	1,682,758	1,979,715
Total	$ 500,921	$ 1,692,286	$ 2,193,207
Disbursements			
Estimated Benefits Paid Open	$ 184,826	$ -	$ 184,826
Estimated Benefits Paid Closed	-	1,355,391	1,355,391
Other expenses	32,001	32,001	64,002
Total	$ 216,827	$ 1,387,392	$ 1,604,219
Allocation of Assets as of 06/30/2018 for Valuation	$ 3,955,799	$ 20,509,869	$ 24,465,668

Asset information was provided by the City.

Development of Funding Value of Assets (Total Plan)

Year Ended June 30:	2016	2017	2018	2019	2020
A. Funding Value Beginning of Year	$34,533,014	$26,777,466	$25,818,120		
B. Market Value End of Year	25,079,950	25,356,335	24,465,668		
C. Market Value Beginning of Year	34,061,083	25,079,950	25,356,335		
D. Non-Investment Net Cash Flow	(9,289,130)	(1,736,674)	(2,806,380)		
E. Investment Income					
E1. Market Total: B - C - D	307,997	2,013,059	1,915,713		
E2. Amount for Immediate Recognition (7.0%)	2,092,191	1,813,639	1,709,045		
E3. Amount for Phased-In Recognition: E1-E2	(1,784,194)	199,420	206,668		
F. Phased-In Recognition of Investment Income					
F1. Current Year: E3 / 3	(594,731)	66,473	68,889		
F2. First Prior Year	(508,054)	(594,731)	66,473	$ 68,889	
F3. Second Prior Year	544,176	(508,053)	(594,732)	66,474	$ 68,890
F4. Total Recognized Investment Gain	(558,609)	(1,036,311)	(459,370)	135,363	68,890
G. Funding Value End of Year: A + D + E2 + F4	26,777,466	25,818,120	24,261,415		
H. Difference between Market & Funding Value	(1,697,516)	(461,785)	204,253		
I. Recognized Rate of Return	**5.13%**	**3.00%**	**5.12%**		
J. Market Value Rate of Return*	1.05%	8.31%	8.00%		
K. Ratio of Funding Value to Market Value: G / B	106.8%	101.8%	99.2%		
L. Estimated June 30 Market Value of Open Plan	3,701,238	3,893,653	3,955,799		
M. Funding Value of Open Plan: K * L	3,952,922	3,963,739	3,924,153		
N. Difference in Open Plan Market & Funding Value: L - M	(251,684)	(70,086)	31,646		

** Treats 6/30/2018 beginning of year adjustment of $1,479,655 as a prior period adjustment.*

The Funding Value of Assets recognizes assumed investment income (line E2) fully each year. Differences between actual and assumed investment income (line E3) are phased-in over a closed three-year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than Market Value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than Market Value. The Funding Value of Assets is unbiased with respect to Market Value. At any time, it may be either greater or less than Market Value. If actual and assumed rates of retirement income are exactly equal for two consecutive years, the Funding Value will become equal to Market Value.

SECTION C

SUMMARY OF VALUATION METHODS AND ASSUMPTIONS

Actuarial Cost Method

Normal cost and the allocation of benefit values between service rendered before and after the valuation date was determined using an individual **entry-age normal cost** valuation method having the following characteristics:

(i) the annual normal costs for each individual active member, payable from the date of employment to the earlier of date of DROP or date of retirement, are sufficient to accumulate the value of the employer provided benefit at the time of retirement or death-in-service; and

(ii) each annual normal cost is a level dollar amount.

Financing of Unfunded Actuarial Accrued Liabilities. Unfunded actuarial accrued liabilities were amortized as a level dollar amount (see page A-3) over a 30-year period.

A reserve for claims incurred but not reported (IBNR) of $11,800 was added to the computed accrued liabilities for the Open Plan. This reserve is approximately three months of expected claims.

A reserve for claims incurred but not reported (IBNR) of $0 was added to the computed accrued liabilities for the Closed Plan.

The present value of future retiree contributions includes all retiree contributions expected to be paid in the future on behalf of the current retirees and current active members.

Actuarial Value of Assets is based on three-year smoothed, market related value. Each year the funding value recognizes (1) non-investment cash flow, (2) the assumed investment income, and (3) one-third of the difference between assumed investment income and actual investment income for the current year and previous two years.

Actuarial Assumptions Used for the Valuation

The actuary calculates the contribution requirements and benefit values of the Plan by applying actuarial assumptions adopted by the Board to the benefit provisions and people information furnished, using the actuarial cost methods described on the previous page.

The principal areas of financial risk which require assumptions about future experience are:

- long-term rates of investment return
- rates of mortality among members, retirees and beneficiaries
- rates of withdrawal from active membership
- rates of disability among members
- the age patterns of service retirements

In a valuation, the actuary calculates the monetary effect of each assumption for as long as a present covered person survives - - a period of time which can be as long as a century.

Actual experience of the Plan will not coincide exactly with assumed experience, regardless of the assumptions and the precision of the many calculations made. Each valuation provides a complete recalculation of assumed future experience and takes into account all past differences between assumed and actual experience. The result is a continual series of adjustments (usually small) to the computed contribution rate.

From time to time it becomes appropriate to modify one or more of the assumptions to reflect experience trends (but not random year to year fluctuations). Methods and assumptions were last updated for the June 30, 2015 actuarial valuation.

All assumptions are adopted by the Board. The rationale for the mortality base table assumptions is the 2008-2013 Retired Mortality Experience Study issued to the respective Pension Boards. There is no assumption for future mortality improvement in this valuation for conservatism. The rationale for the other demographic assumptions is the 2002-2007 Experience Study issued to the respective Pension Boards unless otherwise stated. Based on our capital market assumption modeler, we believe the 7.00% investment return assumptions are reasonable. All assumptions are expectations of future experience, not market measures.

Actuarial Assumptions Used for the Valuation

The rate of investment return was 7.0% a year, net of expenses, compounded annually. This assumption is used to make money payable at one point in time equal in value to a different amount of money payable at another point in time.

Price inflation is not directly used in the valuation. For purposes of assessing the reasonableness of the assumed rate of return, we assumed a price inflation of 2.50% per year.

The mortality table used in evaluating death benefits to be paid to retired members in the General Retirement System was 100% of the RP-2014 Blue Collar Annuitant Table set-forward 1 year for males and 100% of the RP-2014 Blue Collar Annuitant Table set-forward 1 year for females. For Police and Fire, the mortality tables used in evaluating death benefits to be paid to retired members was 100% of the RP-2014 Blue Collar Annuitant Table with no set-forward for males or females. Tables were extended below age 50 with a cubic spline to the published Juvenile rates. This table contains no margin for future improvements in life expectancies for conservatism in this valuation. Sample values are shown below:

Sample Attained Ages	General, EMS, & DOT % Dying within Next Year				Police & Fire % Dying within Next Year			
	Healthy		Disabled		Healthy		Disabled	
	Men	Women	Men	Women	Men	Women	Men	Women
50	0.44%	0.30%	0.44%	0.30%	0.41%	0.28%	0.41%	0.28%
55	0.64%	0.43%	0.64%	0.43%	0.60%	0.40%	0.60%	0.40%
60	0.91%	0.62%	0.91%	0.62%	0.85%	0.57%	0.85%	0.57%
65	1.38%	0.96%	1.38%	0.96%	1.26%	0.87%	1.26%	0.87%
70	2.16%	1.54%	2.16%	1.54%	1.97%	1.40%	1.97%	1.40%
75	3.47%	2.54%	3.47%	2.54%	3.15%	2.30%	3.15%	2.30%
80	5.74%	4.24%	5.74%	4.24%	5.19%	3.82%	5.19%	3.82%

Pre-retirement mortality is based on the corresponding Employee tables. Sample values are shown below:

Sample Attained Ages	General, EMS, & DOT % of Active Members Dying within Next Year				Police & Fire % of Active Members Dying within Next Year			
	Non-Duty Death		Duty Death		Non-Duty Death		Duty Death	
	Men	Women	Men	Women	Men	Women	Men	Women
20	0.04%	0.01%	0.01%	0.00%	0.03%	0.01%	0.03%	0.01%
25	0.04%	0.02%	0.01%	0.01%	0.03%	0.01%	0.03%	0.01%
30	0.04%	0.02%	0.01%	0.01%	0.03%	0.01%	0.03%	0.01%
35	0.05%	0.03%	0.02%	0.01%	0.03%	0.02%	0.03%	0.02%
40	0.07%	0.04%	0.02%	0.01%	0.04%	0.02%	0.04%	0.02%
45	0.11%	0.06%	0.04%	0.02%	0.06%	0.04%	0.06%	0.04%
50	0.18%	0.10%	0.06%	0.03%	0.11%	0.06%	0.11%	0.06%

For General, EMS, and DOT, it is assumed that 25% of deaths before retirement are duty related. For Police and Fire, it is assumed that 50% of deaths before retirement are duty related.

Actuarial Assumptions Used for the Valuation

The rates of retirement used to measure the probability of eligible members retiring during the next year were as follows:

Probabilities of Age/Service Retirement for General Members with More Than 20 Years of Eligibility Service and Eligible to Retire in Component II Before Age 60 on June 30, 2014

Retirement Ages	Percent of Eligible Active Members Retiring within Next Year		
	EMS	General	DOT
45	25%		
46	25%		
47	25%		
48	22%		
49	20%		
50	18%	50%	55%
51	15%	50%	50%
52	15%	45%	50%
53	15%	45%	50%
54	15%	40%	55%
55	15%	30%	50%
56	15%	30%	50%
57	15%	30%	50%
58	15%	30%	50%
59	15%	40%	55%
60	40%	25%	40%
61	30%	25%	30%
62	30%	25%	30%
63	30%	25%	30%
64	30%	25%	30%
65	30%	35%	30%
66	30%	30%	30%
67	30%	25%	30%
68	30%	25%	50%
69	30%	25%	50%
70	100%	20%	100%
71		20%	
72		20%	
73		20%	
74		20%	
75		20%	
76		20%	
77		20%	
78		20%	
79		20%	
80		100%	

Members eligible to retire under Component II as described above are assumed to defer any Component I vested benefits until normal retirement age.

Note that the groups detailed above have different eligibility conditions under Component II.

The rationale for the retirement probabilities is the 2002-2007 Experience Study modified to account for the different eligibility in Component I and split to estimate which eligibility (Component I or Component II) would influence members based on the relative service under each component.

Actuarial Assumptions Used for the Valuation

Rates of Retirement (Continued)

Probabilities of Age/Service Retirement for General Members with Less Than 20 Years of Eligibility Service or Not Eligible to Retire in Component II Before Age 60 on June 30, 2014

Retirement Ages	Percent of Eligible Active Members Retiring within Next Year	
	EMS/DOT	General
62	40%	30%
63	40%	30%
64	40%	30%
65	40%	30%
66	40%	30%
67	40%	30%
68	40%	30%
69	40%	30%
70		30%
71		30%
72		30%
73		30%
74		30%
75		30%
76		30%
77		30%
78		30%
79		30%
80		100%

The rationale for the retirement probabilities is the 2002-2007 Experience Study modified to account for the different eligibility in Component I and split to estimate which eligibility (Component I or Component II) would influence members based on the relative service under each component.

Actuarial Assumptions Used for the Valuation

Rates of Retirement (Continued)

Rates of Early Retirement for General Employees

Percent of Eligible Active Members Retiring Early within Next Year	
Retirement Ages	General
55	7%
56	8%
57	9%
58	10%
59	12%
60	12%
61	12%
62	12%
63	12%
64	12%

Probabilities of Service Retirement for Police and Fire Members Older Than Age 43 or with 17 or More Years of Credited Service (Including Prior Service) as of June 30, 2014

25 & Out Retirement Eligibility

Percent of Eligible Active Members Entering DROP within Next Year		
Years of Service	Police	Fire
24	40%	40%
25	40%	40%
26	40%	40%
27	40%	40%
28	40%	40%
29	100%	100%

20 & Out Retirement Eligibility (DPOA & Fire Equivalent)

Percent of Eligible Active Members Entering DROP within Next Year		
Years of Service	Police	Fire
19	40%	40%
20	40%	40%
21	40%	40%
22	40%	40%
23	40%	40%
24	100%	100%

The rationale for the retirement probabilities is the 2002-2007 Experience Study modified to account for the different eligibility in Component I and split to estimate which eligibility (Component I or Component II) would influence members based on the relative service under each component.

Actuarial Assumptions Used for the Valuation

Rates of Retirement (Continued)

Probabilities of Service Retirement for Police and Fire Members Age 43 or Younger and with Less Than 17 Years of Credited Service as of June 30, 2014

Percent of Eligible Active Members Entering DROP within Next Year		
Retirement Ages	**Police**	**Fire**
50-54	30%	20%
55-59	30%	20%
60	100%	100%

The rationale for the retirement probabilities is the 2002-2007 Experience Study modified to account for the different eligibility in Component I and split to estimate which eligibility (Component I or Component II) would influence members based on the relative service under each component.

Police and Fire

Percent of Eligible Active Members Retiring or Entering DROP within Next Year		
Retirement Ages	**Police**	**Fire**
60-64	40%	100%
65	100%	

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.

Actuarial Assumptions Used for the Valuation

Rates of separation from active membership were as shown below (rates do not apply to members eligible to retire and do not include separation on account of death or disability). This assumption measures the probabilities of members remaining in employment.

Sample Ages	Years of Service	% of Active Members Withdrawing within the Next Year					
		General					
		Men	Women	EMS	DOT	Police	Fire
ALL	0	18.00%	20.00%	11.00%	18.00%	8.50%	5.00%
	1	15.00%	16.00%	10.00%	16.00%	7.50%	4.00%
	2	13.00%	14.00%	8.00%	14.00%	6.00%	3.00%
	3	11.00%	12.00%	8.00%	11.00%	5.00%	2.00%
	4	10.00%	10.00%	7.00%	9.00%	4.50%	2.00%
25	5 & Over	7.60%	7.60%	6.70%	8.00%	4.50%	1.96%
30		7.22%	7.22%	5.90%	7.60%	3.30%	1.62%
35		5.28%	5.28%	5.20%	5.56%	2.30%	1.11%
40		4.05%	4.05%	4.40%	4.26%	1.70%	0.77%
45		3.51%	3.51%	3.40%	3.69%	1.50%	0.60%
50		3.33%	3.33%	2.40%	3.50%	1.10%	0.51%
55		3.33%	3.33%	2.00%	3.50%	0.80%	0.51%
60		3.33%	3.33%	0.00%	3.50%	0.80%	0.51%

Sample Ages	% of Active Members Becoming Disabled within Next Year							
	General		DOT		Police		Fire	
	Ordinary	Duty	Ordinary	Duty	Ordinary	Duty	Ordinary	Duty
25	0.01%	0.25%	0.02%	0.03%	0.06%	0.13%	0.07%	0.34%
30	0.04%	0.29%	0.05%	0.08%	0.07%	0.19%	0.08%	0.52%
35	0.11%	0.34%	0.14%	0.21%	0.08%	0.34%	0.09%	0.90%
40	0.21%	0.39%	0.27%	0.42%	0.11%	0.49%	0.12%	1.30%
45	0.40%	0.45%	0.51%	0.79%	0.16%	0.73%	0.18%	1.92%
50	0.51%	0.52%	0.66%	1.03%	0.47%	1.16%	0.53%	3.06%
55	0.59%	0.60%	0.76%	1.18%	0.73%	1.96%	0.82%	5.18%
60	0.67%	0.70%	0.86%	1.34%	0.83%	2.82%	0.94%	7.47%

Miscellaneous and Technical Assumptions

Benefit Service	Exact fractional service is used to determine the amount of benefit payable.
Decrement Operation	Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal also do not operate during retirement eligibility.
Decrement Timing	Decrements of all types are assumed to occur mid-year.
Eligibility Testing	Eligibility for benefits is determined based upon the age nearest birthday and rounded service on the date the decrement is assumed to occur.
Future Duty Disabilities	Future disabled members are valued assuming a minimum of 25 years of credited service.

APPENDIX

GLOSSARY

Glossary

Actuarial Accrued Liability (AAL). 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.

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.

DFFA. Detroit Fire Fighters Association.

DOT. Department of Transportation.

DPCOA. Detroit Police Command Officers Association.

DPLSA. See LSA.

DPOA. Detroit Police Officers Association.

DROP. Deferred Retirement Option Plan.

EMS. Emergency Medical Service.

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.

Glossary

GASB. The Governmental Accounting Standards Board.

GLWA. Great Lakes Water Authority.

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 8th 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 (UAAL). 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.