City of Southfield Employees Retirement System

Fifty-Sixth Actuarial Valuation Report
as of June 30, 2021

Contents

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November 15, 2021

Board of Trustees
City of Southfield
Employees Retirement System
Southfield, Michigan

Re: City of Southfield Employees Retirement System Actuarial Valuation as of June 30, 2021
Actuarial Disclosures

Dear Trustees:

The results of the June 30, 2021 Annual Actuarial Valuation of the City of Southfield Employees Retirement System are presented in this 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 Retirement System only in its entirety and only with the permission of the Board. GRS is not responsible for unauthorized use of this report.

The purpose of the valuation is to measure the System's funding progress and to determine the employer contribution rate for the fiscal year ending June 30, 2023. This report should not be relied on for any purpose other than the purposes described herein. Determinations of financial results, associated with the benefits described in this report, for purposes other than those identified above may be significantly different. A separate report will be issued to provide actuarial information for GASB Statements No. 67 and No. 68.

The contribution rate in this report is determined using the actuarial assumptions and methods disclosed in Section C of this report. This report includes risk metrics in Appendix 2 but does not include a more robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment.

This valuation assumes the continuing ability of the participating employer to make the contributions necessary to fund this system. A determination regarding whether or not the participating employer is actually able to do so is outside our scope of expertise and was not performed.

The findings in this report are based on data and other information through June 30, 2021. The valuation was based upon information furnished by the City, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal and year-to-year consistency, but did not audit the data. We are not responsible for the accuracy or completeness of the information provided by the City.

This report was prepared using assumptions adopted by the Board. All actuarial assumptions used in this report are reasonable for the purposes of this valuation. All actuarial assumptions used in the valuation follow the guidance in the applicable Actuarial Standards of Practice. Additional information about the actuarial assumptions is included in Section C of this report.

This report was prepared using our proprietary valuation model and related software which, in our professional judgment, has the capability to provide results that are consistent with the purposes of the valuation and has no material limitations or known weaknesses. We performed tests to ensure that the model reasonably represents that which is intended to be modeled.

This report has been prepared by actuaries who have substantial experience valuing public employee retirement systems. To the best of our knowledge, the information contained in this report is accurate and fairly presents the actuarial position of the City of Southfield Employees Retirement System as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices, with the Actuarial Standards of Practice issued by the Actuarial Standards Board and with applicable statutes.

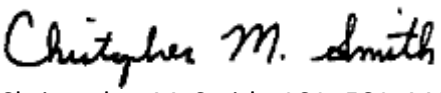
Christopher M. Smith and Jeffrey T. Tebeau are members of the American Academy of Actuaries. These actuaries meet the Academy's Qualification Standards to render the actuarial opinions contained herein.

The signing actuaries are independent of the plan sponsor.

Gabriel, Roeder, Smith & Company will be pleased to review this valuation and report with the Board of Trustees and to answer any questions pertaining to the valuation.

Respectfully submitted,

Gabriel, Roeder, Smith & Company



Christopher M. Smith, ASA, FCA, MAAA

Jeffrey T. Tebeau, FSA, EA, MAAA

CMS/JTT:rmn

C0460

SECTION A

VALUATION RESULTS

Funding Objective

The funding objective of the Retirement System is to establish and receive contributions which, expressed as a percent of active member payroll, will remain approximately level from year-to-year and will accumulate sufficient assets over each member's working lifetime to finance promised benefits throughout retirement.

Contribution Rates

The Retirement System is supported by member contributions, City contributions and investment income from Retirement System assets.

Contributions which satisfy the funding objective are determined by the annual actuarial valuation and are sufficient to:

- 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

- 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).

The computed City contribution rate for the 2023 fiscal year is 28.76% of covered payroll. The details of this contribution rate are shown on page A-2.

The City contribution rate of 28.76% is intended to finance the employer normal cost and to amortize the unfunded actuarial accrued liability as a level percent-of-payroll over a period of 24 years.

The Board of Trustees of the City of Southfield Employees Retirement System confirms that the System provides for payment of the required employer contribution as described in Section 20m of Michigan Public Act No. 728.

Contributions to Provide Benefits for the 2023 Fiscal Year

	Contributions Expressed as % of Active Member Payroll					
Contributions for	Union	PSS	Public Safety Tech.	Total Without Non Union	Non Union	Total
Pension						
Normal cost						
Age & service	10.29 %	9.93 %	9.21 %	10.22 %	9.96 %	10.16 %
Disability	0.54	0.71	0.75	0.56	0.69	0.59
Death-before-retirement	0.24	0.23	0.19	0.24	0.21	0.23
Refunds of member contributions	1.22	1.00	0.98	1.20	0.89	1.12
Administrative expenses	0.45	0.45	0.45	0.45	0.45	0.45
Total	12.74	12.32	11.58	12.67	12.20	12.55
Member contributions (average)	7.14	7.00	7.00	7.13	6.00	6.85
Employer normal cost	5.60	5.32	4.58	5.54	6.20	5.70
Full funding credit [(1)]						0.00
Unfunded actuarial accrued liabilities [(1)]						23.06
Employer Pension Total						**28.76 %**
Minimum Dollar Contribution						**$4,648,973**

(1) *Amortized as a level percent-of-payroll over a period of 24 years. Includes the effects of the lag between the valuation date and the contribution period.*

Determining Employer Dollar Contributions

For any period of time, the percent-of-payroll contribution rate needs to be converted to dollars and then contributed to the Retirement System in a timely manner.

The recommended and current procedure is: (1) ***at the end of each payroll period, multiply the active member payroll for the period by the employer contribution percent***; and (2) ***contribute the dollar amount so determined***.

The projected employer dollar contribution based on the payroll information provided for the valuation, adjusted to reflect assumed payroll increases between the valuation date and the fiscal year for which the contributions are being determined, is $4,648,973. **Therefore, we suggest a minimum contribution of this amount. Please see comments on page A-10 through A-12.**

Valuation Assets and Unfunded Actuarial Accrued Liability
June 30, 2021

In financing the actuarial accrued liabilities, the valuation assets of $117,044,222 were distributed as follows:

	Present Assets Applied to			
Reserves for	**Active & Inactive Member Accrued Liabilities**	**Retired Life Liabilities**	**Contingency Reserve**	**Total**
Employees' Contributions	$ 6,000,918			$ 6,000,918
Employer Contributions				0
Retired Benefit Payments		$111,043,304		111,043,304
Pension Total	$ 6,000,918	$111,043,304	none	$117,044,222

Assets were applied against actuarial accrued liabilities in determining unfunded actuarial accrued liabilities as follows:

	Retired Lives	**Active and Inactive Members**	**Total**
Computed Actuarial Accrued Liabilities	$118,159,715	$54,410,434	$172,570,149
Applied Assets	111,043,304	6,000,918	117,044,222
Unfunded Actuarial Accrued Liabilities	**$ 7,116,411**	**$48,409,516**	**$ 55,525,927**

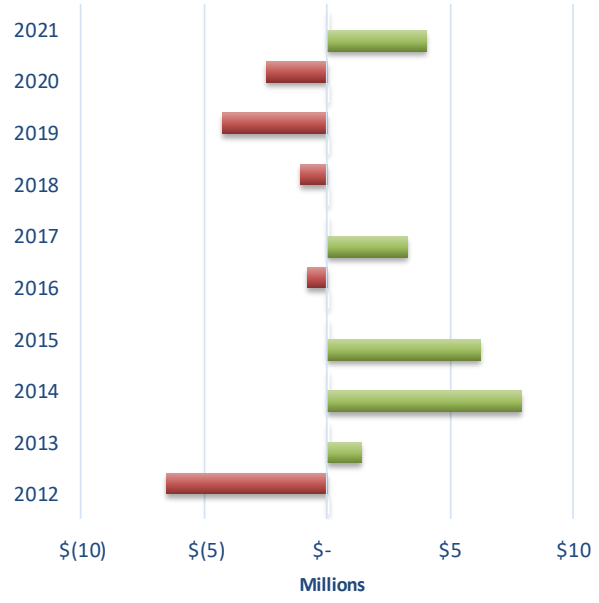
Derivation of Experience Gain (Loss)
Year Ended June 30, 2021

Actual experience will never (except by coincidence) coincide exactly with assumed experience. Gains and losses often cancel each other over a period of years, but sizable year-to-year fluctuations are common. Detail on the derivation of the experience gain (loss) is shown below, along with a year-by-year comparative schedule.

(1)	UAAL* at start of year	$ 58,975,243
(2)	Total normal cost from last valuation (employer + member)	1,910,028
(3)	Actual contributions (employer + member)	5,578,403
(4)	Interest accrual: [(1) + 1/2 [(2) - (3)]] x 7%	3,999,874
(5)	Expected UAAL before changes: (1) + (2) - (3) + (4)	59,306,742
(6)	Change from revised assumptions/methods	300,499
(7)	Change from revised plan provisions	(94,357)
(8)	Expected UAAL after changes: (5) + (6) + (7)	59,512,884
(9)	Actual UAAL at end of year	55,525,927
(10)	Gain (loss): (8) - (9)	3,986,957
(11)	Gain (loss) as percent of actuarial accrued liabilities at start of year ($171,085,236 pension)	2.3%

* *Unfunded actuarial accrued liabilities (full funding credit if in brackets).*

Gains/Losses - Past 10 Years



Summary Statement of System Resources and Obligations
June 30, 2021

Present Resources and Expected Future Resources

	June 30, 2021	June 30, 2020
A. Actuarial value of System assets:		
1. Net assets from System financial statement	$130,382,595	$105,964,642
2. Market value adjustment	(13,338,373)	6,145,351
3. Actual valuation assets	117,044,222	112,109,993
B. Present value of expected future contributions:		
1. For normal costs	5,253,926	5,744,271
2. For unfunded actuarial accrued liabilities	55,525,927	58,975,243
3. Totals	60,779,853	64,719,514
C. Present value of expected future member contributions	7,834,213	7,264,029
D. Total Present and Expected Future Resources	**$185,658,288**	**$184,093,536**

Actuarial Present Value of Expected Future Benefit Payments

A. To retirees and beneficiaries	$118,159,715	$115,625,098
B. To vested terminated members	5,799,702	5,249,552
C. To present active members:		
1. Allocated to service rendered prior to valuation date	48,610,732	50,210,586
2. Allocated to service likely to be rendered after valuation date	13,088,139	13,008,300
3. Totals	61,698,871	63,218,886
D. Total Actuarial Present Value of Expected Future Payments	**$185,658,288**	**$184,093,536**

Computed Employer Contributions
Comparative Statement

Valuation Date	Active Members					Retirees & Beneficiaries			Annual Contributions as Payroll Percents			
			Valuation Payroll		%		Annual Benefits			Employer		
June 30	No.	Ratio to Retired	$ Millions	Average	Incr.	No.	$ Millions	% of Payroll	Member	Pension	Health	Total
2001	433	2.7	$ 18.10	$41,910	3.0%	158	$ 1.95	10.8%	0.84%	0.00%	0.54%	1.38%
2002*	446	2.6	19.30	43,342	3.4	171	2.35	12.2	0.02	1.31	**	1.33
2003#*	454	2.6	20.30	44,774	3.3	173	2.58	12.7	0.02	6.78	**	6.80
2004*	464	2.5	21.40	46,086	2.9	183	3.03	14.2	0.00	13.03	**	13.03
2005*	428	2.0	19.90	46,495	0.9	209	4.00	20.1	0.00	14.56	**	14.56
2006*#	421	1.9	19.90	47,255	1.6	220	4.56	22.9	2.83	13.41	**	16.24
2007@	390	1.7	19.60	50,226	6.3	232	5.25	26.8	2.84	14.04	**	16.88
2008^	376	1.5	19.20	51,055	1.7	248	5.75	30.0	3.02	14.08	**	17.10
2009*	363	1.4	18.70	51,643	1.2	259	6.16	32.8	3.08	15.76	**	18.84
2010#	341	1.2	17.80	52,217	1.1	279	6.96	39.1	3.08	17.49	**	20.57
2011#*	325	1.1	16.83	51,783	(0.8)	290	7.61	45.2	4.96	16.98	**	21.94
2012	297	1.0	15.35	51,690	(0.2)	310	8.50	55.3	4.95	21.40	**	26.35
2013*	272	0.9	14.05	51,670	0.0	312	8.89	63.2	4.98	23.39	**	28.37
2014*	262	0.8	13.46	51,357	(0.6)	317	9.21	68.4	5.08	21.20	**	26.28
2015	266	0.8	13.41	50,403	(1.9)	326	9.58	71.4	5.08	19.23	**	24.31
2016#	269	0.8	13.34	49,593	(1.6)	340	10.15	76.1	5.09	25.57	**	30.66
2017	270	0.8	13.55	50,179	1.2	342	10.29	75.9	5.08	23.83	**	28.91
2018	288	0.8	14.72	51,099	1.8	344	10.61	72.1	5.09	23.22	**	28.31
2019*#	296	0.8	15.06	50,877	(0.4)	367	11.50	76.3	6.10	27.41	**	33.51
2020	304	0.8	16.03	52,716	3.6	363	11.54	72.0	6.11	27.45	**	33.56
2021*#	295	0.8	15.98	54,181	2.8	369	11.77	73.6	6.85	28.76	**	35.61

* *Retirement System amended in 2002, 2003, 2004, 2005, 2006, 2009, 2011, 2012, 2013, 2014, 2019 and 2021.*

\# *Revised actuarial assumptions/methods in 2003, 2006, 2010, 2011, 2016, 2019 and 2021.*

** *Health contributions now part of the actuarial valuation of the VEBA.*

@ *Union member valuation pay includes retroactive pay increases.*

^ *Reflects blended contribution rate due to mid-year benefit change.*

Actuarial Accrued Liabilities and Valuation Assets Comparative Statement (Excluding Health Insurance)

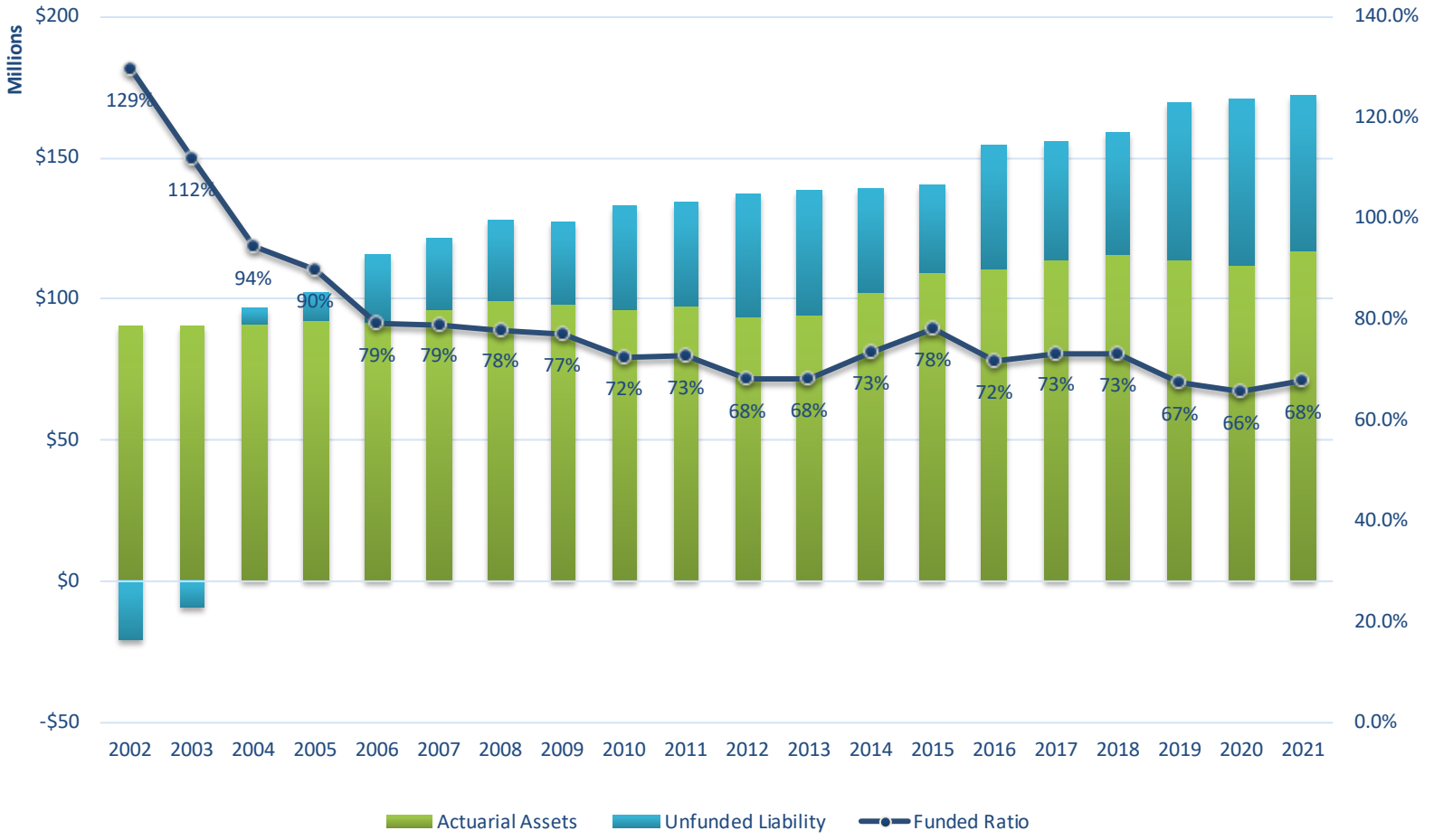
Valuation Date June 30	Actuarial Accrued Liability (AAL)	Valuation Assets	Unfunded Actuarial Accrued Liability (UAAL)	Ratio of Present Assets to AAL	Ratio of UAAL to Valuation Payroll
2001	$ 62,544,823	$ 90,496,433	$ (27,951,610)	144.7%	-
2002*	69,974,666	90,612,387	(20,637,721)	129.5	-
2003#*	80,951,012	90,504,421	(9,553,409)	111.8	-
2004*	96,624,389	91,135,221	5,489,168	94.3	25.7%
2005*	102,530,307	91,997,445	10,532,862	89.7	52.9
2006*#	115,954,378	91,650,440	24,303,938	79.0	122.2
2007	121,719,792	96,080,024	25,639,768	78.9	130.9
2008	127,770,829	99,525,002	28,245,827	77.9	147.1
2009*	127,271,637	97,988,621	29,283,016	77.0	156.2
2010#	132,949,733	96,159,875	36,789,858	72.3	206.6
2011#*	133,961,485	97,303,073	36,658,412	72.6	217.8
2012	137,687,797	93,600,010	44,087,787	68.0	287.2
2013*	138,382,805	94,231,591	44,151,214	68.1	314.1
2014*	139,291,088	102,338,513	36,952,575	73.5	274.6
2015	140,590,694	109,735,931	30,854,763	78.1	230.1
2016#	154,501,425	110,739,313	43,762,112	71.7	328.0
2017	155,475,382	113,872,109	41,603,273	73.2	307.1
2018	158,867,883	116,020,349	42,847,534	73.0	291.2
2019*#	169,587,186	114,203,951	55,383,235	67.3	367.8
2020	171,085,236	112,109,993	58,975,243	65.5	368.0
2021*#	172,570,149	117,044,222	55,525,927	67.8	347.4

** Retirement System amended.*
\# Revised actuarial assumptions and methods.

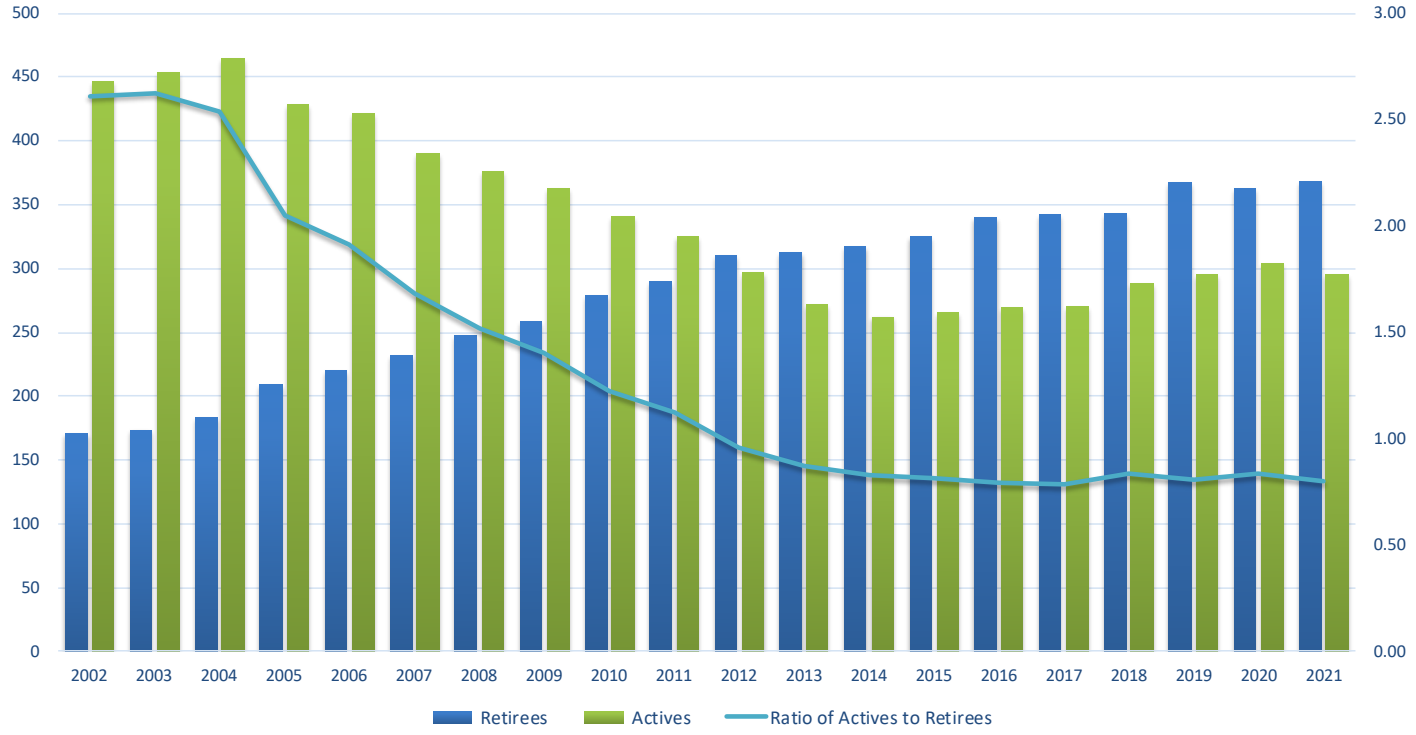
The Ratio of Valuation Assets to AAL is a traditional measure of a System's funding progress. Except in years when the System is amended or actuarial assumptions are revised, this ratio can be expected to gradually trend toward 100% if actuarial assumptions are met.

The Ratio of UAAL to Valuation Payroll is another relative index of condition. Unfunded actuarial accrued liabilities represent debt, while active member payroll represents the System's capacity to collect contributions to pay toward debt. The lower the ratio, the greater the financial strength, or vice-versa.

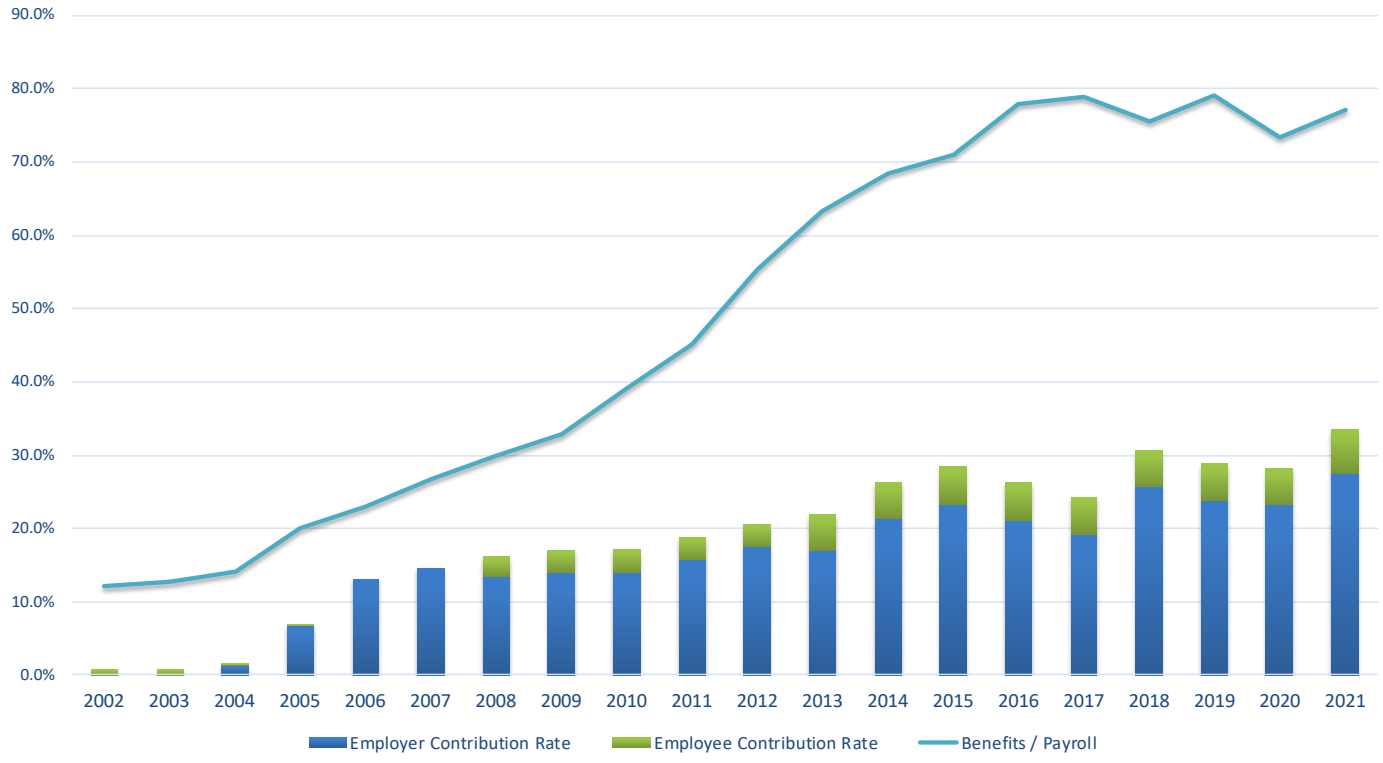
Assets and Unfunded Liabilities
(Excluding Health Insurance)



Active and Retired Population



Contributions and Benefits as a Percent-of-Payroll



Comments

Funded Status

As of June 30, 2021, the funded ratio of the Retirement System is 67.8% based on the funding value of assets, which is higher than last year at 65.5%. The funded ratio is 75.6% based on the market value of assets.

System Experience

Overall, fund experience was more favorable than assumed during the year ending June 30, 2021, producing an experience gain of approximately $4.0 million. This gain is primarily attributable to higher than assumed investment returns offset slightly by demographic experience.

The market rate of return was 30.44% for the fiscal year ended June 30, 2021. The valuation process employs a smoothing mechanism which recognizes investment gains and losses over a 5-year period. Therefore, 20% of this year's gain is recognized in this year's funding value of assets. The recognized portion of gains and losses from the prior 4 years was then combined with the recognized portion of the gain from this year (see page B-15) resulting in a rate of return on the System's funding value of assets of 10.80%, which was higher than the assumed rate of return of 7.00%. As of June 30, 2021, the Funding Value of assets is approximately $13.3 million lower than the Market Value. In the absence of offsetting unfavorable experience, contribution rates are expected to trend downward over the next 4 years due to recognition of investment gains.

Reserve for Retired Benefit Payments

Please note on page A-3 that the liability associated with retiree and beneficiary lives is less than fully funded. It is important that the System receive contributions at least equal to the rates shown in this report. As noted previously, the recommended contribution rates should be considered contribution minimums.

Benefit Changes

Member contributions increased by 1.0% effective July 1, 2021 for all groups with the exception of Management and ACS which remain at 6.0%. This change decreased the computed employer contribution rate by 0.72% of payroll and decreased the accrued liabilities by approximately $94 thousand.

COVID-19

This report was prepared during the recent and still-developing COVID-19 pandemic, which is likely to influence demographic and economic experience, at least in the short-term. Results in this report are developed based on available data without adjustment. We will continue to monitor these developments and their impact on the Retirement System. Actual experience will be reflected in each subsequent report, as it emerges.

Comments (Concluded)

Assumption/Method Changes

Changes resulting from an Experience Study covering the period July 1, 2015 through June 30, 2020 have been implemented in this valuation. The Board adopted some of the actuarial assumption/method changes recommended in our Experience Study report, in particular:

- The retirement rates were decreased for members eligible for the Rule of 82 condition and the pattern of rates for early retirement was changed;
- Turnover Rates were decreased for the first three years of employment and increased thereafter;
- Disability Rates were increased for most ages;
- The wage inflation assumption was lowered from 3.00% to 2.75%;
- The Final Average Compensation load on the retirement decrement liabilities for Tier 1 active members was increased from 3.0% to 4.0%;
- A fixed percent of payroll load to fund administrative expenses was modified to be based on the prior year's administrative expenses as a percent of payroll contribution made by the City;
- The rates of mortality were updated to the most recently published national "general" mortality tables; the Pub-2010 amount-weighted General mortality tables, including the use of the MP-2020 projection scale;
- The amortization period was modified from decreasing 1-year each valuation to decreasing 2-years each valuation until reaching a period of 20 years, at which point the period will revert to decreasing by 1 year each valuation thereafter; and
- The cost method was changed from the ultimate normal cost methodology (i.e., the normal costs for each person based on the Tier 2 benefit structure) to the traditional entry age normal cost method (i.e., normal cost for each person based on his/her own benefit structure).

The changes in the actuarial assumptions and methods increased the accrued liability by approximately $300 thousand and the employer contribution rate by 1.63% of payroll. For more information on the newly adopted assumptions and methods, including the rationale for the assumptions, please refer to the experience study report dated March 19, 2021.

Assumed Rate of Investment Return

At the time GRS presented the results of the Experience Study, the Retirement Board elected to adopt the assumption and method changes proposed by the actuary, except for a decrease in the investment return assumption. Capital market assumptions for future investment return continue to decline, especially over shorter time horizons. Based on the general trend in capital market assumptions, we expect the Board may need to lower the assumed rate of return in the near future.

Other Observations

Funding Policy and Future Expected System Contributions and Funded Status

Given the System's funding policy, if all actuarial assumptions are met (including the assumption of the System earning 7.0% on the funding value of assets), it is expected that:

(1) The employer normal cost as a percentage of pay will trend to the level of the Tier 2 normal cost as Tier 1 employees exit the active population and are replaced by new Tier 2 employees;
(2) The unfunded actuarial accrued liabilities will increase for several years before decreasing and is expected to be fully amortized by June 30, 2044; and
(3) The funded status of the plan will decrease for several years and then will increase gradually towards a 100% funded ratio.

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. Unless otherwise indicated, with regard to any funded status measurements presented in this report:

(1) The measurement is inappropriate for assessing the sufficiency of System assets to cover the estimated cost of settling the System's benefit obligations, for example: transferring the liability to an unrelated third party in a market value type transaction.
(2) The measurement is dependent upon the actuarial cost method which, in combination with the System's amortization policy (funding policy), affects the timing and amounts of future contributions. The amounts of future contributions will most certainly differ from those assumed in this report due to future actual experience differing from assumed experience based upon the actuarial assumptions. The current funded status is 67.8%. Even if the funded status measurement in this report was 100%, it would not be synonymous with no required future contributions. If the funded status were 100%, the System 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).

Risks Associated with Measuring the Accrued Liability and Actuarially Determined Contribution

The determination of the accrued liability and the actuarially determined contribution requires the use of assumptions regarding future economic and demographic experience. Risk measures, as illustrated in this report, are intended to aid in the understanding of the effects of future experience differing from the assumptions used in the course of the actuarial valuation. Risk measures may also help with illustrating the potential volatility in the accrued liability and the actuarially determined contribution that result from the differences between actual experience and the actuarial assumptions.

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions due to changing conditions; 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 System's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

Examples of risk that may reasonably be anticipated to significantly affect the plan's future financial condition include:

1. **Investment Risk** – actual investment returns may differ from the expected returns;
2. **Asset/Liability Mismatch** – changes in asset values may not match changes in liabilities, thereby altering the gap between the accrued liability and assets and consequently altering the funded status and contribution requirements;
3. **Contribution Risk** – actual contributions may differ from expected future contributions. For example, actual contributions may not be made in accordance with the plan's funding policy or material changes may occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base;
4. **Salary and Payroll Risk** – actual salaries and total payroll may differ from expected, resulting in actual future accrued liability and contributions differing from expected;
5. **Longevity Risk** – members may live longer or shorter than expected and receive pensions for a period of time other than assumed; and
6. **Other Demographic Risks** – members may terminate, retire or become disabled at times or with benefits other than assumed resulting in actual future accrued liability and contributions differing from expected.

The effects of certain trends in experience can generally be anticipated. For example, if the investment return since the most recent actuarial valuation is less (or more) than the assumed rate, the cost of the plan can be expected to increase (or decrease). Likewise, if longevity is improving (or worsening), increases (or decreases) in cost can be anticipated.

The computed contribution shown on page A-2 may be considered as a minimum contribution rate that complies with the Board's funding policy. The timely receipt of the actuarially determined contributions is critical to support the financial health of the plan. Users of this report should be aware that contributions made at the actuarially determined rate do not necessarily guarantee benefit security. Please see Appendix 2 for an additional discussion of risk.

SECTION B

SUMMARY OF BENEFIT PROVISIONS AND VALUATION DATA

Summary of Benefit Provisions Evaluated
June 30, 2021
Tier I Members

Regular Retirement (no reduction factor for age)

Eligibility - Sum of age and service equals 82, or age 65 with 5 or more years of service.

Annual Amount - Total service times 2.5% of FAC.

Type of Final Average Compensation - Highest 3 consecutive years out of last 5.

Normal Form of Payment - Ten-year certain and life.

Early Retirement (age reduction factor used)

Eligibility - Age 57 with 20 or more years of service or age 60 with 10 years of service.

Annual Amount - Computed as regular retirement, but reduced 1/2 of 1% for each month by which retirement date precedes attainment of age 62 with 20 or more years of service or age 65 with 10 or more years of service.

Deferred Retirement (vested benefits)

Eligibility - 10 or more years of service. Reduced benefit may begin at age 60 with 10 or more years of service. Full benefit eligibility at age 57 with 25 or more years of credited service; or 62 with 20 to 25 years of credited service; or 65 with 10 to 20 years of credited service, or sum of frozen years of credited service plus age equals 82 points.

Annual Amount - Computed as regular retirement but based upon service and final average compensation and benefit levels in place at termination of covered employment.

Duty Disability

Eligibility - No service requirement.

Annual Amount - Computed as a regular retirement with additional service credit granted from date of disability to age 60 if under age 60. Worker's Compensation payments are offset.

Summary of Benefit Provisions Evaluated
June 30, 2021
Tier I Members
(Continued)

Non-Duty Disability Retirement

Eligibility - 10 years of service.

Annual Amount - Computed as regular retirement but based upon service and final average compensation at commencement of disability.

Death-in-Service

Eligibility - 10 years of service.

Annual Amount - Computed as regular retirement but based upon service and final average compensation on the day before death.

Member Contributions

AFSCME: 6.41% (7.41% effective 7/1/2021), made as a salary reduction under 414(h).
Management and ACS: 6.00%, made as a salary reduction under 414(h).
All Others: 6.00% (7.00% effective 7/1/2021), made as a salary reduction under 414 (h).

Refund of Member Contributions

Public Safety Technicians - Member receives a refund of account balance as of 6/30/95 (with interest) upon commencement of Normal Retirement, Early Retirement, Disability Retirement, Death-in-Service or Deferred Retirement benefits.

Others - Member receives a refund of account balance as of 6/30/2009 (with interest) upon commencement of Normal Retirement, Early Retirement, Disability Retirement, Death-in-Service or Deferred Retirement benefits. (The recently added member contribution requirements are excluded from this refund provision.)

Summary of Benefit Provisions Evaluated
June 30, 2021
Tier I Members
(Concluded)

Covered Compensation

Items of compensation recognized for Retirement System purposes include: base salary, longevity pay, pay in lieu of holiday and/or vacation time for the current year, lump sum vacation payoff at retirement up to 400 hours maximum, and residency bonus. Items of compensation not recognized for retirement purposes are overtime pay, expense allowances, and lump sum payments at retirement in consideration of unused sick leave.

Tier I Members Definition

Tier I members are defined as:

PST members hired prior to February 2, 2009;
PSS members hired prior to March 2, 2009;
AFSCME 329 members hired prior to April 23, 2007;
AFSCME 3636 members hired prior to March 6, 2007;
TPOAM members hired prior to April 9, 2007;
46th District Court members hired prior to September 1, 2005; and
All other covered employees hired prior to June 1, 2005.

Summary of Benefit Provisions Evaluated
June 30, 2021
Tier II Members

Regular Retirement (no reduction factor for age)

Eligibility - Age 57 with 25 years of service, age 62 with 20 years of service, or age 65 with 10 or more years of service.

Annual Amount - Total service times 2.0% of FAC. Maximum benefit is 70% of FAC.

Type of Final Average Compensation - Highest 5 consecutive years out of last 10.

Normal Form of Payment - Ten-year certain and life.

Early Retirement (age reduction factor used)

Eligibility - Age 57 with 20 or more years of service or age 60 with 10 years of service.

Annual Amount - Computed as regular retirement, but reduced 1/2 of 1% for each month by which retirement date precedes attainment of age 62 with 20 or more years of service or age 65 with 10 or more years of service.

Deferred Retirement (vested benefits)

Eligibility - 10 or more years of service. Reduced benefit may begin at age 60 with 10 or more years of service. Full benefit eligibility at age 57 with 25 or more years of credited service; or 62 with 20 to 25 years of credited service; or 65 with 10 to 20 years of credited service.

Annual Amount - Computed as regular retirement but based upon service and final average compensation and benefit levels in place at termination of covered employment.

Duty Disability

Eligibility - No service requirement.

Annual Amount - Computed as a regular retirement with additional service credit granted from date of disability to age 60 if under age 60. Worker's Compensation payments are offset.

Summary of Benefit Provisions Evaluated
June 30, 2021
Tier II Members
(Continued)

Non-Duty Disability Retirement

Eligibility - 10 years of service.

Annual Amount - Computed as regular retirement but based upon service and final average compensation at commencement of disability.

Death-in-Service

Eligibility - 10 years of service.

Annual Amount - Computed as regular retirement but based upon service and final average compensation on the day before death.

Member Contributions

AFSCME: 6.41% (7.41% effective 7/1/2021), made as a salary reduction under 414(h).
Management and ACS: 6.00%, made as a salary reduction under 414(h).
All Others: 6.00% (7.00% effective 7/1/2021), made as a salary reduction under 414 (h).

Refund of Member Contributions

None.

Covered Compensation

Items of compensation recognized for Retirement System purposes include: base salary, longevity pay, pay in lieu of holiday and/or vacation time for the current year, lump sum vacation payoff at retirement up to 100 hours maximum, and residency bonus. Items of compensation not recognized for retirement purposes are overtime pay, expense allowances, and lump sum payments at retirement in consideration of unused sick leave.

Summary of Benefit Provisions Evaluated
June 30, 2021
Tier II Members
(Concluded)

Tier II Members Definition

Tier II members are defined as:

PST members hired on or after February 2, 2009;
PSS members hired on or after March 2, 2009;
AFSCME 329 members hired on or after April 23, 2007;
AFSCME 3636 members hired on or after March 6, 2007;
TPOAM members hired on or after April 9, 2007;
46th District Court members hired on or after September 1, 2005; and
All other covered employees hired on or after June 1, 2005.

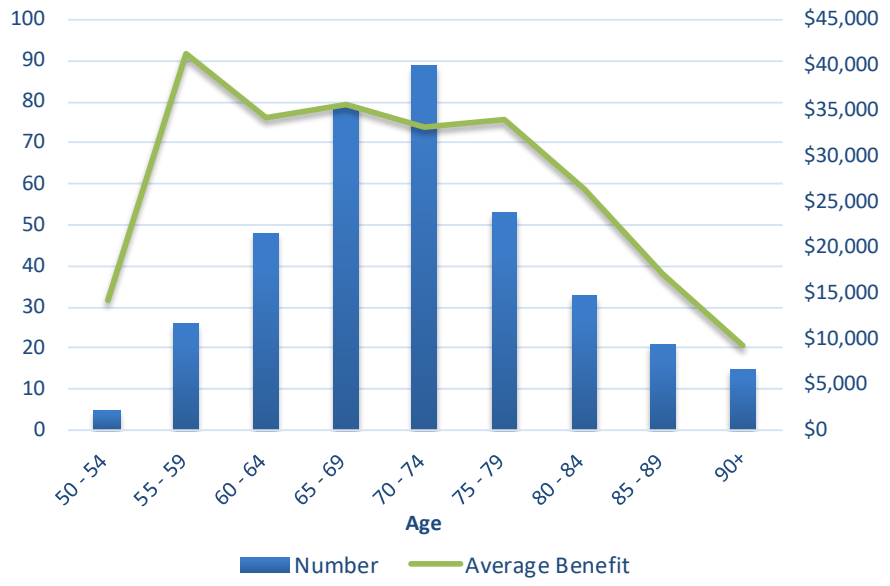
Retirees and Beneficiaries Added to and Removed from Rolls
Comparative Statement

Year Ended June 30	Added to Rolls		Removed from Rolls		Rolls End of Year		Average Pension
	No.	Annual Pensions	No.	Annual Pensions	No.	Annual Pensions	
2001	8	$ 148,596			158	$ 1,953,823	$ 12,366
2002	20	466,138	7	$ 70,436	171	2,349,525	13,740
2003	13	349,624	11	121,044	173	2,578,105	14,902
2004	15	474,390	5	24,631	183	3,027,864	16,546
2005	33	1,051,230	7	77,869	209	4,001,225	19,145
2006	15	627,079	4	64,773	220	4,563,532	20,743
2007	21	776,448	9	93,812	232	5,246,168	22,613
2008	22	608,934	6	101,357	248	5,753,745	23,201
2009	20	540,900	9	136,703	259	6,157,942	23,776
2010	22	823,801	2	21,467	279	6,960,276	24,947
2011	20	748,778	9	101,215	290	7,607,839	26,234
2012	26	956,865	6	68,128	310	8,496,576	27,408
2013	20	612,810	18	224,308	312	8,885,078	28,478
2014	13	462,366	8	140,283	317	9,207,161	29,045
2015	23	619,476	14	249,148	326	9,577,489	29,379
2016	24	724,735	10	148,125	340	10,154,099	29,865
2017	19	553,942	17	420,182	342	10,287,859	30,081
2018	11	447,833	9	121,868	344	10,613,824	30,854
2019	32	1,138,957	9	254,996	367	11,497,785	31,329
2020	13	378,719	17	332,425	363	11,544,079	31,802
2021	17	518,651	11	292,789	369	11,769,941	31,897

Retirees and Beneficiaries June 30, 2021
Tabulated by Attained Ages

Attained Ages	Age and Service		Casualty		Totals	
	No.	Annual Pensions	No.	Annual Pensions	No.	Annual Pensions
50 - 54	1	$ 10,506	4	$ 61,152	5	$ 71,658
55 - 59	24	1,033,766	2	38,430	26	1,072,196
60 - 64	45	1,571,198	3	74,745	48	1,645,943
65 - 69	76	2,773,752	3	57,167	79	2,830,919
70 - 74	87	2,913,434	2	55,257	89	2,968,691
75 - 79	48	1,546,877	5	257,817	53	1,804,694
80 - 84	31	844,216	2	31,270	33	875,486
85 - 89	20	353,395	1	7,448	21	360,843
90 - 94	13	130,638			13	130,638
95 - 99	1	2,372	1	6,501	2	8,873
Totals	**346**	**$ 11,180,154**	**23**	**$ 589,787**	**369**	**$ 11,769,941**

Average Age at Retirement: 60.5 years
Average Age Now: 72.2 years



Inactive Vested Members June 30, 2021
Tabulated by Attained Age

Attained Age	No.	Estimated Annual Pensions
40 - 44	2	$ 23,784
45 - 49	9	200,210
50 - 54	7	185,971
55 - 59	14	250,583
60 - 64	14	201,269
Totals	**46**	**$ 861,817**

Average Age Now: 55.7 years

The inactive vested member statistics above exclude records for people who terminated without a vested benefit who are pending payment of their refundable employee contributions as of the valuation date; however, the total of the lump sum payments for these individuals ($42,689) is included in the inactive vested member liabilities.

Active Members June 30, 2021
Tabulated by Valuation Divisions

Valuation Division	No.	Annual Payroll	Average Age	Average Service
Union Members				
Tier I	80	$ 4,576,149	56.0 years	22.4 years
Tier II	134	6,477,387	45.9	3.8
Public Safety Supervisors				
Tier I	4	259,392	51.0	22.0
Tier II	2	103,444	36.4	2.9
Non-Union Members				
Tier I	27	2,197,929	50.6	22.5
Tier II	35	1,712,326	40.2	4.8
Public Safety Technicians				
Tier I	4	220,479	52.0	23.1
Tier II	9	436,389	33.1	2.4
Totals	**295**	**$ 15,983,495**	**48.1**	**11.1**

Active Members Added to and Removed from Rolls

Year Ended June 30	Number Added During Year	Terminations During Year										Active Members End of Year
		Retirement		Disabled		Died-in-Service		Withdrawal				
								Vested	Other	Total		
		A	E	A	E	A	E	A	A	A	E	
1997	56	5	10.8	1	1.2	0	1.0	4	14	18	13.8	401
1998	24	5	9.0	0	1.3	0	1.1	4	17	21	17.4	399
1999	26	12	10.5	1	1.4	2	1.1	4	25	29	16.5	381
2000	64	7	11.7	1	1.0	1	0.9	2	22	24	14.5	412
2001	44	7	7.9	0	1.0	1	1.0	4	11	15	20.4	433
2002	42	8	8.7	2	1.0	1	1.0	3	15	18	21.6	446
2003	24	4	11.3	0	1.0	1	1.1	4	7	11	21.4	454
2004	31	11	11.5	1	0.8	0	1.1	1	8	9	13.8	464
2005	10	29	14.5	0	0.8	2	1.2	2	13	15	24.7	428
2006	11	11	11.9	0	0.9	0	1.1	1	6	7	20.9	421
2007	4	18	12.9	0	1.0	2	1.1	5	10	15	15.9	390
2008	11	16	12.7	0	0.9	1	1.1	1	7	8	15.7	376
2009	7	13	12.0	2	0.9	0	1.1	2	3	5	14.1	363
2010	2	19	12.9	0	1.0	1	1.2	1	3	4	12.8	341
2011	4	18	13.0	0	1.1	0	1.3	1	1	2	10.7	325
2012	1	23	13.3	1	0.9	0	0.4	1	4	5	6.7	297
2013	2	19	12.3	0	0.8	0	0.3	6	2	8	5.4	272
2014	10	7	11.6	2	0.8	1	0.3	5	5	10	4.5	262
2015	29	16	14.0	1	0.6	0	0.4	4	4	8	4.9	266
2016	36	19	12.3	3	0.6	0	0.4	4	7	11	8.6	269
2017	27	14	14.7	2	0.6	1	0.6	2	7	9	12.1	270
2018	34	7	14.5	3	0.5	0	0.5	1	5	6	12.9	288
2019	43	20	19.6	0	0.4	0	0.5	3	12	15	15.0	296
2020	32	8	16.7	0	0.4	0	0.4	3	13	16	17.7	304
2021	18	11	17.9	0	0.4	0	0.4	4	12	16	17.9	295
5-Year Totals	154	60	83.4	5	2.3	1	2.4	13	49	62	75.6	
10-Year Totals	232	144	146.9	12	6.0	2	4.2	33	71	104	105.7	

A = actual
E = expected

Active Members at Year End

Year	Number	Valuation Payroll $ Millions	Averages			
			Age Years	Service Years	Pay	% Inc.
1997	401	$ 14.5	45.0	11.3	$ 36,240	0.5%
1998	399	15.1	45.7	11.8	37,895	4.6
1999	381	15.1	46.2	12.3	39,753	4.9
2000	412	16.8	46	11.6	40,675	2.3
2001	433	18.1	46.1	11.5	41,910	3.0
2002	446	19.3	46.2	11.5	43,342	3.4
2003	454	20.3	46.8	11.9	44,774	3.3
2004	464	21.4	47.3	12.1	46,086	2.9
2005	428	19.9	47.5	12.2	46,495	0.9
2006	421	19.9	48.0	12.5	47,255	1.6
2007 (1)	390	19.6	48.3	12.9	50,226	6.3
2008 (2)	376	19.2	48.6	13.4	51,055	1.7
2009	363	18.7	49.2	13.8	51,643	1.2
2010	341	17.8	49.5	14.4	52,217	1.1
2011	325	16.8	50.0	14.8	51,783	(0.8)
2012	297	15.4	50.1	15.4	51,690	(0.2)
2013	272	14.1	50.7	15.8	51,670	0.0
2014	262	13.5	51.2	16.2	51,357	(0.6)
2015	266	13.4	50.2	15.4	50,403	(1.9)
2016	269	13.3	49.7	14.2	49,593	(1.6)
2017	270	13.5	49.0	13.6	50,179	1.2
2018	288	14.7	48.6	12.7	51,099	1.8
2019	296	15.1	47.6	11.4	50,877	(0.4)
2020	304	16.0	48.0	11.0	52,716	3.6
2021	295	16.0	48.1	11.1	54,181	2.8

(1) *Union member valuation pay includes retroactive pay increases.*

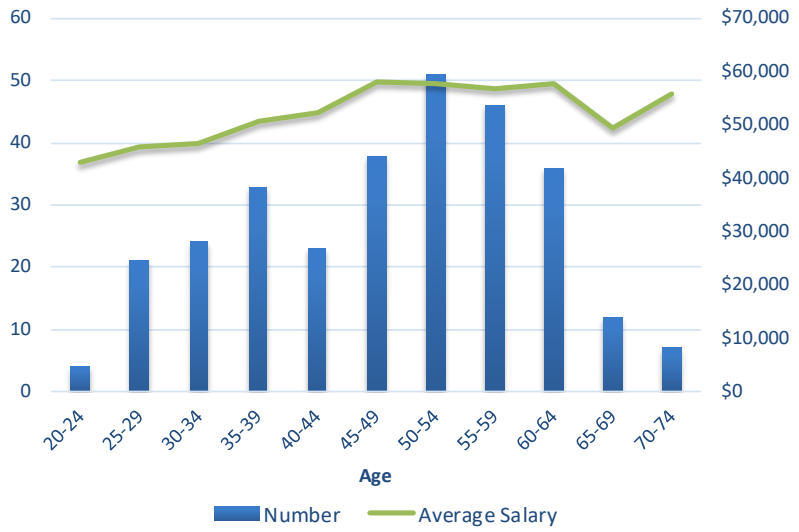
(2) *Pay for Public Safety Supervisors and Public Safety Technicians includes load for expected contract increases.*

Active Members June 30, 2021
by Attained Age and Years of Service

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
20-24	4							4	$ 172,658
25-29	20	1						21	964,923
30-34	17	7						24	1,119,287
35-39	24	6	1	2				33	1,675,895
40-44	9	7		4	3			23	1,208,256
45-49	10	3	1	5	17	2		38	2,209,719
50-54	19	4	1	10	10	5	2	51	2,955,462
55-59	12	9		10	10	3	2	46	2,610,207
60-64	4	8	2	6	8	2	6	36	2,081,699
65-69	4	1	1	2	3	1		12	592,910
70-74	1	1	2		2		1	7	392,479
75-79								0	
Totals	**124**	**47**	**8**	**39**	**53**	**13**	**11**	**295**	**$ 15,983,495**

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age: 48.1 years
Service: 11.1 years
Annual Pay: $ 54,181



Summary of Current Asset Information Furnished for Valuation

Balance Sheet as of June 30, 2021

Reported Assets - Market Value		Reserves for*	
Cash & equivalents	$ 250	Employees' contributions	$ 6,000,918
Receivables & Accruals	551,944	Employer contributions	6,221,962
Prepaid Assets	982,363	Retired benefit payments	118,159,715
Debt Securities	13,674,825	Market value of assets	130,382,595
Short-term Investments	5,098,080		
Equity Securities	107,048,808		
Other Investments	3,332,759		
Collateral for securities lending	4,282,950		
Payable - Securities lending	(4,282,950)		
Payable - Due to Brokers and Liab.	(306,434)		
Payable - Due to Primary Gov.	0		
Total Current Assets	**$130,382,595**	**Total Reserves**	**$130,382,595**

* *These reserve amounts were not supplied by the City. We have set the Employees' Contributions Reserve to the sum of the employee contributions submitted for each individual in the valuation. The Retired Benefit Payments Reserve has been set equal to the liability for retired members to the extent possible. The Employer Contribution Reserve is a balancing item to allow the sum of the three reserves to equal the market value of assets submitted for the valuation.*

Revenues and Expenditures

	Total
Market Value - July 1, 2020	$105,964,642
Revenues	
Employee contributions	1,040,024
Employer contributions	4,538,379
Other	0
Net investment income	31,219,769
Total	36,798,172
Expenditures	
Benefit payments (pension only) & Refund of member contributions	12,308,598
Other	0
Administrative expenses	71,621
Total	12,380,219
Market Value - June 30, 2021	$130,382,595

Development of Funding Value of System Assets (Valuation Assets)
June 30, 2021

Year Ended June 30:	2021	2022	2023	2024	2025
A. Funding Value Beginning of Year	$ 112,109,993				
B. Market Value End of Year	130,382,595				
C. Market Value Beginning of Year	105,964,642				
D. Non-Investment Net Cash Flow					
D1. Audit Adjustment (BOY)	0				
D2. Contributions less benefit payments and admin. expenses (MOY)	(6,801,816)				
E. Investment Income					
E1. Market Total: B - C - D1 - D2	31,219,769				
E2. Assumed Rate (i)	7.00%				
E3. Amount for Immediate Recognition: i * (A +D1+ D2 / 2)	7,609,636				
E4. Amount for Phased-In Recognition: E1 - E3	23,610,133				
F. Phased-In Recognition of Investment Income					
F1. Current Year: 0.20 x E4	4,722,027				
F2. First Prior Year	(1,412,692)	$ 4,722,027			
F3. Second Prior Year	(772,118)	(1,412,692)	$ 4,722,027		
F4. Third Prior Year	232,583	(772,118)	(1,412,692)	$ 4,722,027	
F5. Fourth Prior Year	1,356,609	232,581	(772,119)	(1,412,693)	$ 4,722,025
F6. Total Recognized Investment Gain	$ 4,126,409	$ 2,769,798	$ 2,537,216	3,309,334	4,722,025
G. Funding Value End of Year: A + D1 +D2 + E3 + F6	**117,044,222**				
H. Difference Between Market & Funding Value	13,338,373				
I. Recognized Rate of Return - Funding Value	**10.80%**				
J. Recognized Rate of Return - Market Value	**30.44%**				
K. Ratio of Funding to Market Value of Assets	**89.77%**				

The Funding Value of Assets recognizes assumed investment income (line E3) fully each year. Differences between actual and assumed investment income (line E4) are phased-in over a closed 5-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 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 recognized and assumed rates of retirement income are exactly equal for 4 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 actuarial cost method having the following characteristics:

- The annual normal cost for each individual active member, payable from the date of employment to the date of retirement, is sufficient to accumulate the value of the member's benefit at the time of retirement; and

- Each annual normal cost is a constant percentage of the member's year by year projected covered pay.

Financing of Unfunded Actuarial Accrued Liabilities. The Unfunded Actuarial Accrued Liability (UAAL) was determined using the funding value of assets and actuarial accrued liability calculated as of the valuation date. The UAAL amortization payment (one component of the contribution requirement), is the level percent of pay required to fully amortize the UAAL over a 24-year period beginning with the fiscal year beginning July 1, 2022. The amortization period will decrease by two years each valuation until reaching an amortization period of 20 years at which point the amortization period decreases by one year thereafter. This UAAL payment reflects the payment expected to be made between the valuation date and the date contributions determined by this report are scheduled to begin. The UAAL contribution rate may be adjusted in cases where annual total payroll growth is less than the assumption of 2.75%.

Funding Value of Assets. The Funding Value of Assets used for funding purposes is derived as follows: prior year Funding Value of Assets are increased by contribution and expected investment income and reduced by refunds, benefit payments and expenses. To this amount is added 20% of the difference between the expected and actual investment income for each of the previous 5 years.

Actuarial Assumptions Used for the Valuation

The actuary calculates the contribution requirements and benefit values of the System by applying actuarial assumptions to the benefit provisions and member information furnished, using the actuarial cost method described on the previous page.

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

- Long-term rates of investment return to be generated by the assets of the System;
- Patterns of pay increases to members;
- Rates of mortality among members, retirees and beneficiaries;
- Rates of withdrawal of active members (without entitlement to a retirement benefit);
- Rates of disability among members; and
- The age patterns of actual 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 System will not coincide exactly with assumed experience, regardless of the accuracy of the assumptions, or the skill of the actuary 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). The assumptions are established by the Board after consulting with the actuary. New assumptions were adopted for the June 30, 2021 valuation pursuant to the Experience Study dated March 19, 2021, which contains the rationale for those assumptions. All actuarial assumptions are based on future expectations, not market measures.

The rate of investment return was 7.00% per year, compounded annually (net of investment expenses). 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. The assumed real rate of return (the net return in excess of the wage inflation rate) was 4.25%. No specific price inflation assumption is needed for this valuation, however, the economic assumptions are consistent with a price inflation of 2.25% per annum. Economic experience during the last 5 years is shown in the table below:

	Year Ending June 30					5-Year
	2021	2020	2019	2018	2017	Average
1) Nominal recognized rate	10.8%	4.3%	5.2%	8.1%	9.6%	7.6%
2) Increase in CPI	5.4	0.6	1.6	2.9	1.6	2.4
3) Average salary increase	2.8	3.6	(0.4)	1.8	1.2	1.8
4) Real return as measured by						
- CPI: (1)-(2)						5.2
- Wage inflation: (1)-(3)						5.8

The nominal rate of return was computed using the approximate formula: *i = I divided by 1/2 (A+B-I),* where I is recognized investment income net of expenses, A is the beginning of year asset value and B is the end of year asset value.

The rates of salary increase used for individual members are in accordance with the following table. This assumption is used to project a member's current salary to the salaries upon which benefit amounts will be based.

	Salary Increase Assumptions for an Individual Member		
Sample Ages	Merit & Seniority	Base (Economic)	Increase Next Year
20	3.00%	2.75%	5.75%
25	2.25	2.75	5.00
30	1.13	2.75	3.88
35	0.73	2.75	3.48
40	0.38	2.75	3.13
45	0.38	2.75	3.13
50	0.25	2.75	3.00
55	0.25	2.75	3.00
60	0.00	2.75	2.75
65	0.00	2.75	2.75

If the number of active members remains constant, then the total active member payroll is expected to increase 2.75% annually, the base portion of the individual salary increase assumptions.

***Mortality*.** This assumption is used to measure the probabilities of members dying before retirement and the probabilities of each benefit payment being made after retirement. The tables used are as follows:

- **Healthy Pre-Retirement**: The Pub-2010 Amount-Weighted, General, Employee, Male and Female tables, a base year of 2010 and future mortality improvements projected using scale MP-2020.
- **Healthy Post-Retirement**: The Pub-2010 Amount-Weighted, General, Healthy Retiree, Male and Female tables, with a base year of 2010 and future mortality improvements projected using scale MP-2020.
- **Disability Retirement**: The Pub-2010 Amount-Weighted, General, Disabled Retiree, Male and Female, with a base year of 2010 and future mortality improvements projected using scale MP-2020.

Sample Attained Ages	Healthy Pre-Retirement Future Life Expectancy (Years)		Healthy Post-Retirement Future Life Expectancy (Years)		Disabled Retirement Future Life Expectancy (Years)	
	Men	Women	Men	Women	Men	Women
55	33.97	36.01	30.41	33.22	22.49	25.23
60	29.07	31.00	25.70	28.37	19.36	22.00
65	24.32	26.08	21.22	23.67	16.47	18.78
70	19.68	21.25	16.99	19.15	13.69	15.43
75	15.16	16.55	13.08	14.92	10.95	12.17
80	10.76	12.01	9.63	11.13	8.41	9.28

Applicable to calendar year 2021. Life expectancies in future years are determined by the fully generational MP-2020 projection scale.

Additional margin for future mortality improvements are included in the projection scale.

These rates were first used for the June 30, 2021 valuation.

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

Retirement Ages	Percents of Active Members Retiring Within Next Year		
	Normal Retirement	Early Retirement	Rule of 82
50			20%
51			20
52			20
53			20
54			20
55			20
56			20
57	20%	5%	20
58	20	5	20
59	20	10	30
60	20	5	30
61	20	5	30
62	35	15	30
63	15	15	30
64	15	25	30
65	15	100	30
66	40		30
67	40		30
68	40		30
69	40		30
70	100		100

Tier I members: Assumed to be eligible for normal retirement when the sum of their age and service is at least 82, or age 65 with 5 or more years of service. A member was assumed to be eligible for early retirement after attaining age 57 with 20 or more years of service or age 60 with 10 or more years of service.

Tier II members: Assumed to be eligible for normal retirement at age 57 with 25 or more years of service, age 62 with 20 or more years of service, or age 65 with 10 or more years of service. A member was assumed to be eligible for early retirement after attaining age 57 with 20 or more years of service or age 60 with 10 or more years of service.

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 Separating
ALL	0	16.00%
	1	12.00
	2	9.00
	3	8.00
	4	6.00
	5	5.50
	6	5.00
	7	4.00
	8	3.50
	9	3.50
	10 & Over	
20		12.60
25		12.60
30		7.63
35		6.44
40		4.13
45		2.03
50		1.33
55		1.33
60		1.33
65		1.33

Rates of disability were as follows:

Sample Ages	% of Active Members Becoming Disabled
20	0.10%
25	0.10
30	0.10
35	0.10
40	0.36
45	0.41
50	0.57
55	0.77
60	1.02
65	1.23

Miscellaneous and Technical Assumptions

Marriage Assumption:	100% of members are assumed to be married for purposes of valuing death-in-service benefits.
Pay Increase Timing:	Beginning of the fiscal year.
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 service nearest whole year on the date the decrement is assumed to occur.
Benefit Service:	Exact fractional service as of the valuation date is used to determine the amount of benefit payable.
Decrement Relativity:	Decrement rates are used directly from the experience study, without adjustment for multiple decrement table effects.
Decrement Operation:	Disability and withdrawal decrements do not operate after member reaches retirement eligibility. All decrements operate during the first 10 years of service.
Miscellaneous Adjustment Factors:	A load of 1.0% is used to approximate the value of the lump sum vacation payoff for the Tier II members. For Tier I members, a 4.0% load is used. A 1.3% load is included on deferred member liabilities for the subsidized 50% joint-and-survivor annuity option for married participants.
Administrative Expense Load:	A load based on the prior year's administrative expenses as a percent of payroll contribution made by the City to fund administrative expenses.
Service Credit Accruals:	It is assumed that members accrue one year of service credit per year.
Incidence of Contributions:	Contributions are assumed to be received continuously throughout the year based upon the computed percent-of-payroll shown in this report, and the actual payroll payable at the time contributions are made.
Salary Adjustments:	Annual pay is provided for valuation purposes by the City. Adjustments were made to the pay provided to remove certain one-time lump sum payouts for 31 active members. The amounts of the lump sums excluded from the reported payroll were provided by the City.

SECTION D

OPERATION OF THE RETIREMENT SYSTEM

Basic Financial Objective and Operation of the Retirement System

Benefit Promises Made Which Must Be Paid For. A retirement program is an orderly means of handing out, keeping track of, and financing contingent pension promises to a group of employees. As each member of the retirement program acquires a unit of service credit they are, in effect, handed an "IOU" which reads: "The Employees Retirement System promises to pay you one unit of retirement benefits, payments in cash commencing when you retire."

The principal related financial question is: When shall the money required to cover the "IOU" be contributed? This year, when the benefit of the member's service is received? Or, some future year when the "IOU" becomes a cash demand?

The Constitution of the State of Michigan is directed to the question:

> "Financial benefits arising on account of service rendered in each fiscal year shall be funded during that year and such funding shall not be used for financing unfunded accrued liabilities."

This Retirement System meets this constitutional requirement by having the following ***Financial Objective: To establish and receive contributions, expressed as percents of active member payroll, which will remain approximately level*** from year-to-year and will not have to be increased for future generations of taxpayers.

Translated into actuarial terminology, a level percent-of-payroll contribution objective means that the contribution rate must be at least:

> ***Normal Cost*** (the current value of benefits likely to be paid on account of members' service being rendered in the current year)
>
> . . . plus . . .
>
> ***Interest on the Unfunded Actuarial Accrued Liability*** (the difference between the actuarial accrued liability and current System assets).

If contributions to the retirement program are less than the preceding amount, the difference, **plus investment earnings not realized thereon**, will have to be contributed at some later time, or, benefits will have to be reduced, to satisfy the fundamental fiscal equation under which all retirement programs must operate; that is:

$$B = C + I - E$$

Benefit payments to any group of members and their beneficiaries cannot exceed the sum of:

Contributions received on behalf of the group

. . . plus . . .

Investment earnings on plan assets

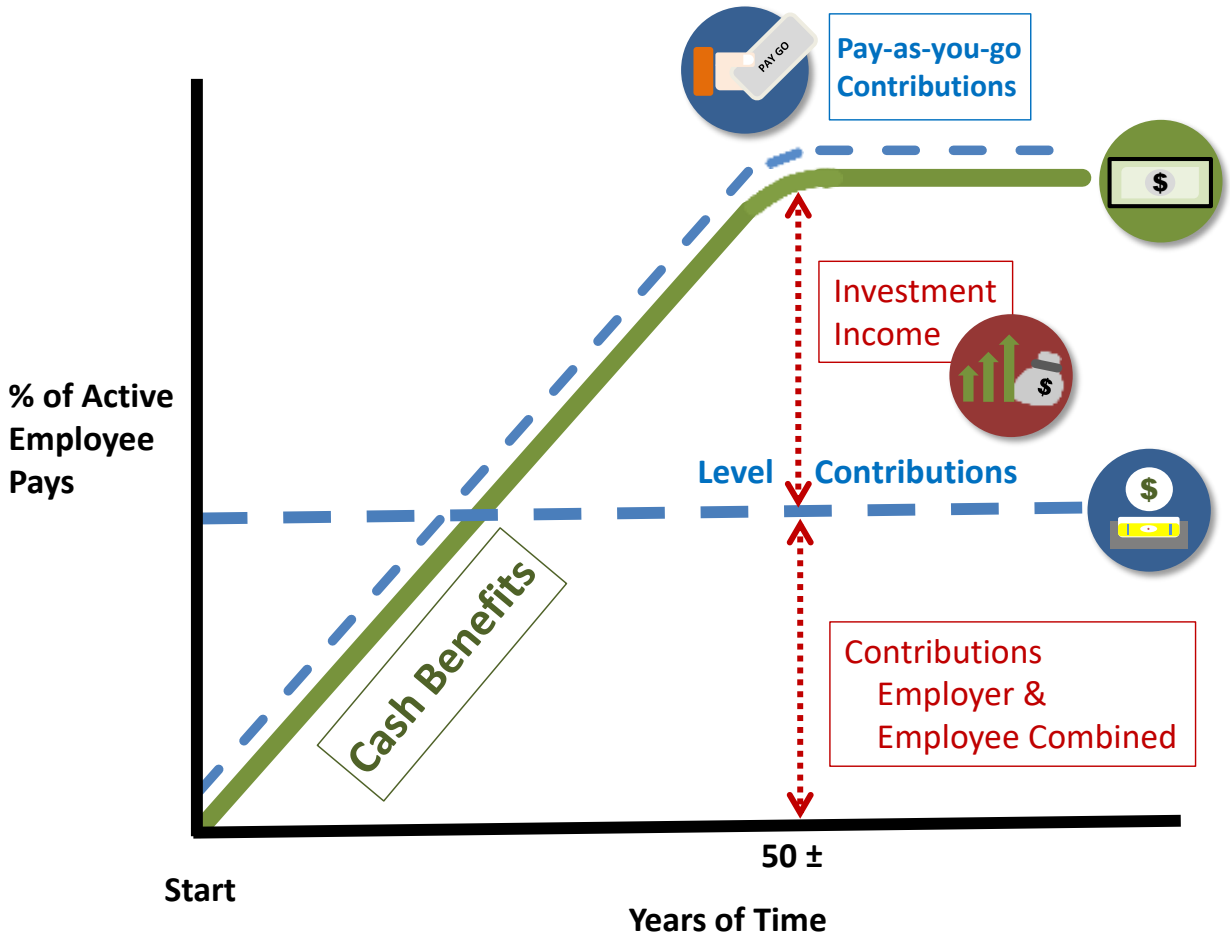
. . . minus . . .

Expenses incurred in operating the program.

There are retirement programs designed to defer the bulk of contributions far into the future. Lured by artificially low present contributions, the inevitable consequence of a relentlessly increasing contribution rate -- to a level which may be greatly in excess of the level percent-of-payroll rate -- is ignored. ***This method of financing is prohibited in Michigan by the State Constitution***.

A by-product of a level percent-of-payroll contribution objective is the accumulation of invested assets for varying periods of time. Invested assets are a by-product of level percent-of-payroll contributions, not the objective. Investment income becomes the third and largest contributor to the retirement program, and the amount is directly related to the amount of contributions and investment performance.

Computed Contribution Rate Needed To Finance Benefits. From a given schedule of benefits and from the data furnished, the actuary calculates the contribution rate ***by means of an actuarial valuation*** - the technique of assigning monetary values to the risks assumed in operating a retirement program.

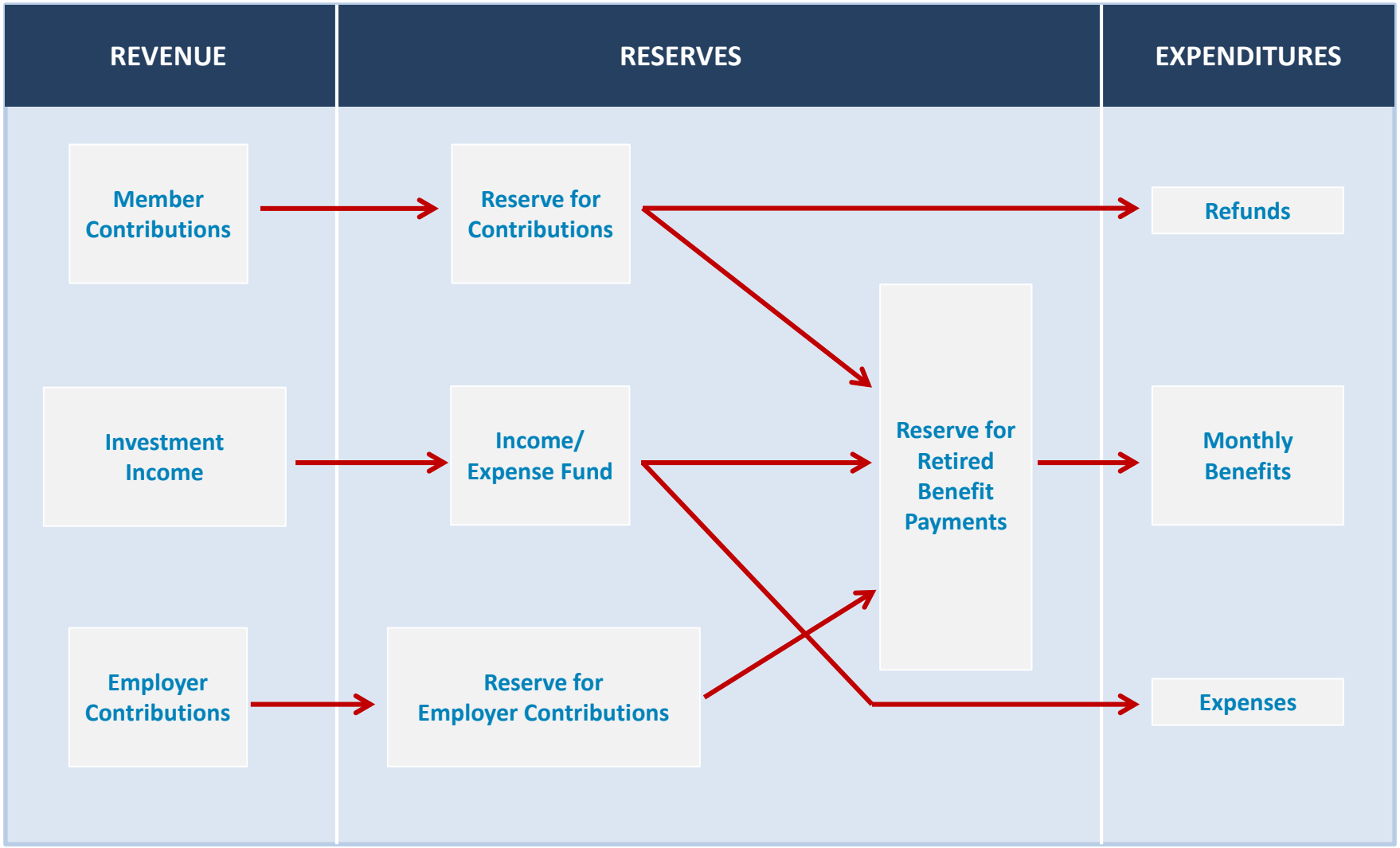


CASH BENEFITS LINE. This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

LEVEL CONTRIBUTION LINE. Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:

- **Economic Risk Areas**
  - Rates of investment return
  - Rates of pay increase
  - Changes in active member group size
- **Non-Economic Risk Areas**
  - Ages at actual retirement
  - Rates of mortality
  - Rates of withdrawal of active members (turnover)
  - Rates of disability

Flow of Money Through the Retirement System



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 of 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.

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.

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.

Plan Termination Liability **-** The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for future service and salary. The termination liability will generally be less than the liabilities computed on a "going-concern" basis and is not normally determined in a routine actuarial valuation.

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.

Glossary

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. Generally based on book value plus a portion of unrealized appreciation or depreciation.

APPENDIX 1

ACTUARIAL FUNDING POLICY

City of Southfield Employees Retirement System
Actuarial Funding Policy

Adopted: September 23, 2014

WHEREAS, the City of Southfield Employees Retirement System ("Retirement System") is established and administered pursuant to Title I, Chapter 9 of the City of Southfield Code of Ordinances, as amended, applicable collective bargaining agreements, and applicable state and federal laws including, but not limited to Public Act 314 of 1965, as amended ("Act 314") [MCL 38.1132 *et seq*.], and

WHEREAS, the Board of Trustees of the Retirement System ("Board") is vested with the authority and fiduciary responsibility for the proper administration and operation of the Retirement System, and

WHEREAS, the Board, in consultation with its Actuary, has an obligation to establish the economic and demographic assumptions to be utilized in performing the required actuarial valuation of the Retirement System and in determining the required annual employer contribution to the Retirement System, and

WHEREAS, the Board is aware of upcoming changes to the accounting and reporting standards approved by the Governmental Accounting Standards Board (GASB) for public pension plans, and

WHEREAS, the Board wishes to establish a formal Actuarial Funding Policy addressing the funding objectives and actuarial assumptions to be utilized in determining the funding status of the Retirement System, therefore be it

RESOLVED, that the Board hereby adopts the following Actuarial Funding Policy:

I. GENERAL

A. Purpose

In light of upcoming changes to the GASB financial accounting and reporting standards for public pension plans, the Board of Trustees of the Retirement System desires to establish a formal Actuarial Funding Policy to ensure the systematic funding of future pension obligations of the Retirement System.

B. Policy Objectives

(1) Maintain adequate levels of assets sufficient to fund all benefits expected to be paid to members and beneficiaries when due.
(2) Maintain stability of employer contributions rates, consistent with other funding objectives.
(3) Support the public policy goals of accountability and transparency.
(4) Monitor material risks to assist in any risk management strategies the Board deems appropriate.
(5) Promote intergenerational equity. Each generation of members and employers should incur the cost of benefits for the employees who provide services to them, rather than deferring costs to future members and employers.

(6) Provide a reasonable margin for adverse experience to offset risk.
(7) Review the Plan's investment return assumption, potentially in conjunction with a periodic asset liability study and in consideration of the Board's risk profile.
(8) Continue the systematic reduction of the Plan's Unfunded Actuarial Accrued Liabilities (UAAL).

II. LEGAL

A. Annual Actuarial Valuation

Section 20h(4) of Act 314 [MCL 38.1140h(4)], requires the Retirement System to have an actuarial valuation performed annually as follows:

> Except as otherwise provided in this subsection, a system shall have an annual actuarial valuation with assets valued on a market-related basis. The actuarial present value of total projected benefits shall include all pension benefits to be provided by the system to members or beneficiaries pursuant to the terms of the system and any additional statutory or contractual agreements to provide pension benefits through the system that are in force at the actuarial valuation date, including, but not limited to, service credits purchased by members, deferred retirement option plans, early retirement programs, and postretirement adjustment programs. A system that has less than $20,000,000.00 is only required to have an actuarial valuation as required under this subsection done every other year.

B. Annual Employer Contribution

The Board is required, pursuant to Section 20m of Act 314 [MCL 38.1140m], to annually certify the annual required contribution to be made by the employer as follows:

> The governing board vested with the general administration, management, and operation of a system or other decision-making body that is responsible for implementation and supervision of any system shall confirm in the annual actuarial valuation required under section 20h and the summary annual report required under section 13 that each system under this act provides for the payment of the required employer contribution as provided in this section and shall confirm in the summary annual report that the system has received the required employer contribution for the year covered in the summary annual report. The required employer contribution is the actuarially determined contribution amount. An annual required employer contribution in a system under this act shall consist of a current service cost payment and a payment of at least the annual accrued amortized interest on any unfunded actuarial liability and the payment of the annual accrued amortized portion of the unfunded principal liability. For fiscal years that begin before January 1, 2006, the required employer contribution shall not be determined using an amortization period greater than 40 years. Except as otherwise provided in this section, for fiscal years that begin after December 31, 2005, the required employer contribution shall not be determined using an amortization period greater than 30 years. In a plan year, any current service cost payment may be offset by a credit for amortization of accrued assets, if any, in

excess of actuarial accrued liability. A required employer contribution for a system administered under this act shall allocate the actuarial present value of future plan benefits between the current service costs to be paid in the future and the actuarial accrued liability. The governing board vested with the general administration, management, and operation of a system or other decision-making body that is responsible for implementation and supervision of a system shall act upon the recommendation of an actuary and the board and the actuary shall take into account the standards of practice of the actuarial standards board of the American academy of actuaries in making the determination of the required employer contribution.

III. POLICY

A. Actuarial Cost Method

(1) The individual entry age actuarial cost method of valuation shall be utilized in determining actuarial accrued liability and normal cost with the following characteristics:
   (a) the annual normal costs for each individual active member, payable from the date of employment to the date of retirement, are sufficient to accumulate the value of the member's benefit at the time of retirement; and
   (b) each annual normal cost is a constant percentage of the member's year by year projected covered pay; and
   (c) the normal cost is based upon the benefit provisions applicable for employees hired on or after June 1, 2005 (February 2, 2009 for PST and March 2, 2009 for PSS).

(2) Differences in the past between assumed experience and actual experience (actuarial gains and losses) shall be factored into the actuarial accrued liability.

(3) The normal cost shall be determined on an individual basis for each active member.

B. Asset Smoothing Method

The investment gains or losses of each valuation period, resulting from the difference between actual investment return and assumed investment return, shall be recognized annually in level amounts over a period not to exceed five (5) years in calculating the funding value of assets.

C. Amortization Method

(1) A level percent of payroll amortization method shall be used to systematically pay off the unfunded actuarial accrued liabilities over a closed amortization period not to exceed 30 years.
(2) Unfunded liabilities associated with benefit changes or assumption changes shall be funded over a period determined by the Board in consultation with its actuary.
(3) Unfunded liabilities arising from benefit changes provided to retirees or in conjunction with early retirement incentive programs offered by the employer shall be separately funded over a period determined by the Board in consultation with its actuary.

D. Assumptions

The economic and demographic actuarial assumptions utilized to determine the contribution requirements and benefit values of the Retirement System shall be determined by the Board in consultation with its actuary and its investment consultant with respect to its economic assumptions.

E. Funding Target

(1) The targeted funded ratio of the Retirement System shall be 100%.
(2) The employer contribution rate shall at least be equal to the normal cost unless the funded ratio of the Retirement System exceeds 120%.
(3) A funding plan shall be developed by the Board in consultation with its actuary if the funded ratio of the Retirement System falls below 50%, which may include additional funding requirements.

F. Risk Management

(1) Assumption Changes

(a) The actuarial assumptions utilized to determine the annual contribution requirements and valuations shall be those last adopted by the Board based on the most recent experience study and upon the advice and recommendation of the Board's actuary. The Board's actuary shall conduct an experience study once every five years unless the Board, due to unique circumstances, elects to have such a study performed at an earlier or later date. The results of the experience study shall be the basis for the actuarial assumptions recommended to the Board.
(b) The actuarial assumptions may be revised during the five-year period between experience studies if significant plan design changes or other significant economic events occur, as advised by the actuary.

(2) Risk Measures. The following risk measures will be annually determined to provide quantifiable measurements of risk as it applies to the Retirement System.

(a) Funded ratio;
(b) Unfunded actuarial accrued liabilities – the years required to pay down the unfunded liabilities of the Retirement System based upon the current funding schedule;
(c) Total unfunded actuarial accrued liabilities as a percentage of total payroll;
(d) Total assets as a percentage of total payroll; and
(e) Total actuarial accrued liabilities as a percentage of total payroll.

(3) Risk Control

(a) The Board shall carefully monitor the risk measures identified above and shall consider steps to mitigate risk, particularly as the funded ratio increases.

IV. REVIEW AND AMENDMENT

A. Periodic Review

This Actuarial Funding Policy shall be reviewed no less frequently than once every five years in conjunction with the required experience study performed by the Board's actuary, and may be reviewed at any time in the Board's discretion.

B. Amendment

The Board, in consultation with its Actuary and Legal Counsel, may amend this Actuary Funding Policy at any time as deemed necessary to address changes in the makeup, benefit structure and/or funding status of the Retirement System.

APPENDIX 2

RISK MEASURES

Plan Maturity Measures

Risks facing a pension plan evolve over time. A young plan with virtually no investments and paying few benefits may experience little investment risk. An older plan with a large number of members in pay status and a significant trust may be much more exposed to investment risk. Generally accepted plan maturity measures include the following:

	2021	2020	2019	2018	2017
Ratio of actives to retirees and beneficiaries	0.80	0.84	0.81	0.84	0.79
Ratio of retiree actuarial accrued liability to total liability	68%	68%	68%	65%	65%
Ratio of net cash flow to market value of assets	-5%	-6%	-7%	-6%	-6%

RATIO OF ACTIVES TO RETIREES AND BENEFICIARIES

A young plan with many active members and few retirees will have a high ratio of actives to retirees. A mature open plan may have close to the same number of actives to retirees resulting in a ratio near 1.0. A super-mature or closed plan may have significantly more retirees than actives resulting in a ratio below 1.0.

RATIO OF RETIREE ACTUARIAL ACCRUED LIABILITY TO TOTAL LIABILITY

The ratio of retiree liability to the total actuarial accrued liability gives an indication of the maturity of the plan. As the ratio increases, cash flow needs increase, and the liquidity needs of the portfolio change. A ratio on the order of 50% indicates a maturing system. In the case of a closed plan, this ratio will eventually reach 100%.

RATIO OF NET CASH FLOW TO MARKET VALUE OF ASSETS

A positive net cash flow means contributions exceed benefits and expenses. A negative cash flow means existing funds are being used to make payments. A certain amount of negative net cash flow is generally expected to occur when benefits are prefunded through a qualified trust. Large negative net cash flows as a percent of assets may indicate a super-mature plan or a need for additional contributions.

ADDITIONAL RISK ASSESSMENT

Additional risk assessment is outside the scope of the annual actuarial valuation. Additional assessment may include scenario tests, sensitivity tests, stochastic modeling, stress tests, and a comparison of the present value of accrued benefits at low-risk discount rates with the actuarial accrued liability.

Risk Measures

Actuarial Valuation Date	(1) Actuarial Value of Assets	(2) Actuarial Accrued Liability (AAL) Entry Age	(3) Unfunded AAL (UAAL) (2) - (1)	(4) Covered Payroll	(5) Funded Ratio (1) / (2)	(6) Assets / Payroll (1) / (4)	(7) Liability / Payroll (2) / (4)	(8) Unfunded / Payroll (3) / (4)
6/30/2012	$ 93,600,010	$137,687,797	$44,087,787	$15,351,949	68.0 %	609.7 %	896.9 %	287.2 %
6/30/2013 [(a)]	94,231,591	138,382,805	44,151,214	14,054,199	68.1	670.5	984.6	314.1
6/30/2014 [(a)]	102,338,513	139,291,088	36,952,575	13,455,647	73.5	760.6	1035.2	274.6
6/30/2015	109,735,931	140,590,694	30,854,763	13,407,323	78.1	818.5	1048.6	230.1
6/30/2016 [(a)]	110,739,313	152,519,439	41,780,126	13,340,553	72.6	830.1	1143.3	313.2
6/30/2017	113,872,109	153,722,260	39,850,151	13,548,441	74.1	840.5	1134.6	294.1
6/30/2018	116,020,349	157,286,969	41,266,620	14,716,566	73.8	788.4	1068.8	280.4
6/30/2019 [(a)]	114,203,951	167,969,797	53,765,846	15,059,719	68.0	758.3	1115.4	357.0
6/30/2020	112,109,993	169,628,374	57,518,381	16,025,535	66.1	699.6	1058.5	358.9
6/30/2021 [(a)]	117,044,222	172,570,149	55,525,927	15,983,495	67.8	732.3	1079.7	347.4

(a) Revised actuarial assumptions, methods, and/or benefit changes. Beginning with 2016, the AAL displayed is based on each member's individual benefit structure.

(5) The Funded Ratio is the most widely known measure of a retirement system's financial strength, but the trend in the funded ratio is much more important than the absolute ratio. The funded ratio should trend to 100%. As it approaches 100%, it is important to re-evaluate the level of investment risk in the portfolio and potentially to re-evaluate the assumed rate of return.

(6) and (7) The ratios of assets and liabilities to payroll give an indication of both maturity and volatility. Many systems have ratios between 500% and 700%. Ratios significantly above that range may indicate difficulty in supporting the benefit level as a level % of pay. For systems that are closed to new hires, it is expected that these ratios will grow as payroll declines.

(8) The ratio of the unfunded liability to payroll gives an indication of the retirement system sponsor's ability to actually pay off the unfunded liability. A ratio above approximately 300% or 400% may indicate difficulty in discharging the unfunded liability within a reasonable time frame.