Summary of Current Asset Information Furnished for Valuation

Balance Sheet as of June 30, 2022

Reported Assets - Market Value		Reserves for*	
Cash & equivalents	$ 250	Employees' contributions	$ 6,104,076
Receivables & Accruals	199,733	Employer contributions	0
Prepaid Assets	1,024,353	Retired benefit payments	107,278,555
Debt Securities	10,635,781	Market value of assets	113,382,631
Short-term Investments	6,690,742		
Equity Securities	91,466,774		
Other Investments	3,723,018		
Collateral for securities lending	353,548		
Payable - Securities lending	(353,548)		
Payable - Due to Brokers and Liab.	(358,020)		
Payable - Due to Primary Gov.	0		
Total Current Assets	**$113,382,631**	**Total Reserves**	**$113,382,631**

* *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, 2021	$130,382,595
Revenues	
Employee contributions	1,129,746
Employer contributions	4,603,072
Other	0
Net investment income	(10,231,311)
Total	(4,498,493)
Expenditures	
Benefit payments (pension only) & Refund of member contributions	12,417,360
Other	0
Administrative expenses	84,111
Total	12,501,471
Market Value - June 30, 2022	$113,382,631

Development of Funding Value of System Assets (Valuation Assets)
June 30, 2022

Year Ended June 30:	2022	2023	2024	2025	2026
A. Funding Value Beginning of Year	$ 117,044,222				
B. Market Value End of Year	113,382,631				
C. Market Value Beginning of Year	130,382,595				
D. Non-Investment Net Cash Flow					
D1. Audit Adjustment (BOY)	0				
D2. Contributions less benefit payments and admin. expenses (MOY)	(6,768,653)				
E. Investment Income					
E1. Market Total: B - C - D1 - D2	(10,231,311)				
E2. Assumed Rate (i)	7.00%				
E3. Amount for Immediate Recognition: i * (A +D1+ D2 / 2)	7,956,193				
E4. Amount for Phased-In Recognition: E1 - E3	(18,187,504)				
F. Phased-In Recognition of Investment Income					
F1. Current Year: 0.20 x E4	(3,637,501)				
F2. First Prior Year	4,722,027	$ (3,637,501)			
F3. Second Prior Year	(1,412,692)	4,722,027	$ (3,637,501)		
F4. Third Prior Year	(772,118)	(1,412,692)	4,722,027	$(3,637,501)	
F5. Fourth Prior Year	232,581	(772,119)	(1,412,693)	4,722,025	$ (3,637,500)
F6. Total Recognized Investment Gain	$ (867,703)	$ (1,100,285)	$ (328,167)	$ 1,084,524	$ (3,637,500)
G. Funding Value End of Year: A + D1 +D2 + E3 + F6	**117,364,059**				
H. Difference Between Market & Funding Value	(3,981,428)				
I. Recognized Rate of Return - Funding Value	**6.24%**				
J. Recognized Rate of Return - Market Value	**(8.06)%**				
K. Ratio of Funding to Market Value of Assets	**103.51%**				

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 five-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 four 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 22-year period beginning with the fiscal year beginning July 1, 2023. 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 five 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 five years is shown in the table below:

	Year Ending June 30					5-Year
	2022	2021	2020	2019	2018	Average
1) Nominal recognized rate	6.2%	10.8%	4.3%	5.2%	8.1%	6.9%
2) Increase in CPI	9.1	5.4	0.6	1.6	2.9	3.9
3) Average salary increase	3.8	2.8	3.6	(0.4)	1.8	2.3
4) Real return as measured by						
- CPI: (1)-(2)						3.0
- Wage inflation: (1)-(3)						4.6

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	34.03	36.07	30.49	33.30	22.61	25.35
60	29.13	31.05	25.78	28.44	19.46	22.09
65	24.37	26.13	21.29	23.73	16.55	18.85
70	19.73	21.30	17.04	19.20	13.75	15.50
75	15.20	16.59	13.12	14.97	11.00	12.23
80	10.79	12.05	9.67	11.17	8.45	9.32

Applicable to calendar year 2022. 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. For the June 30, 2022 valuation, the annual pay provided by the City was used without adjustment.

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

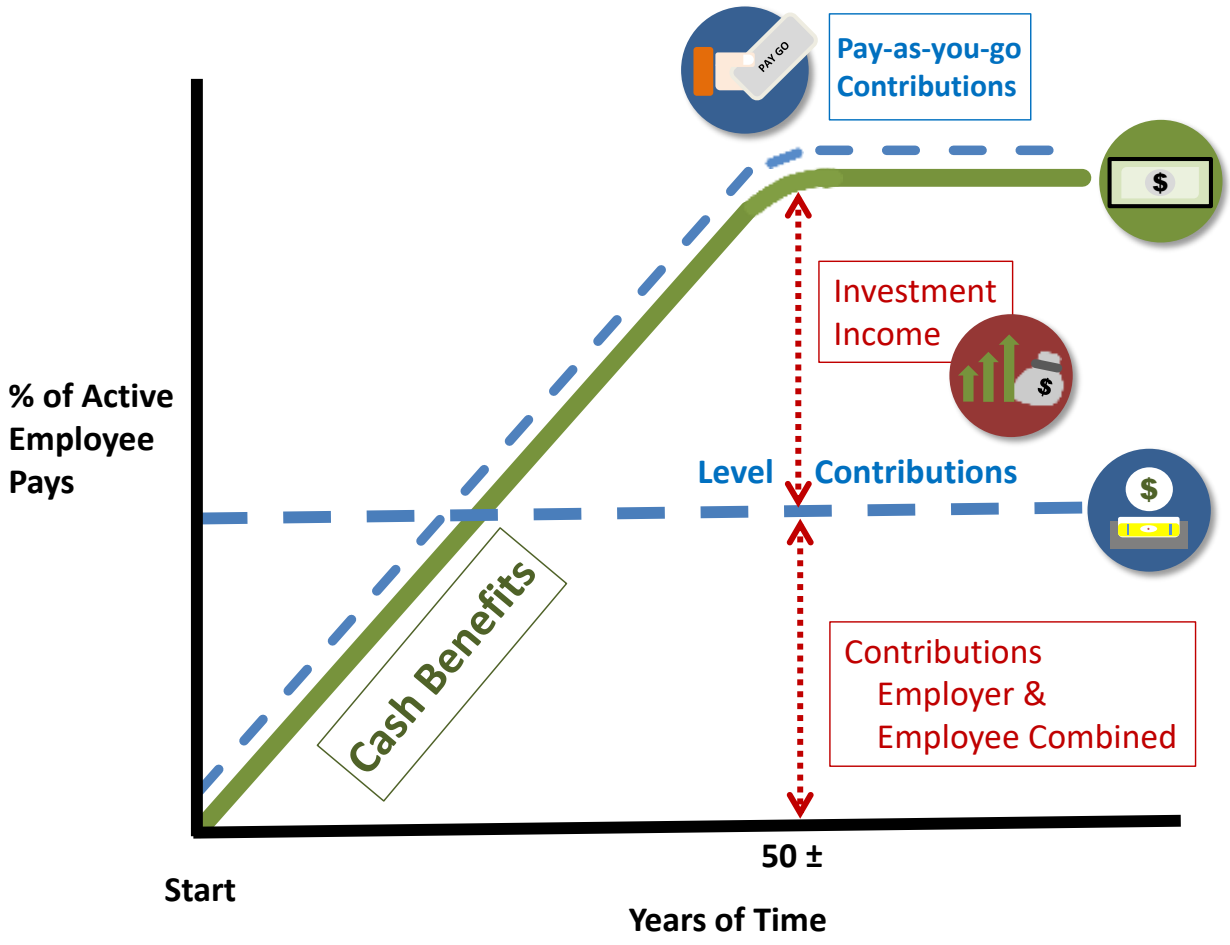
. . . minus . . .

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.

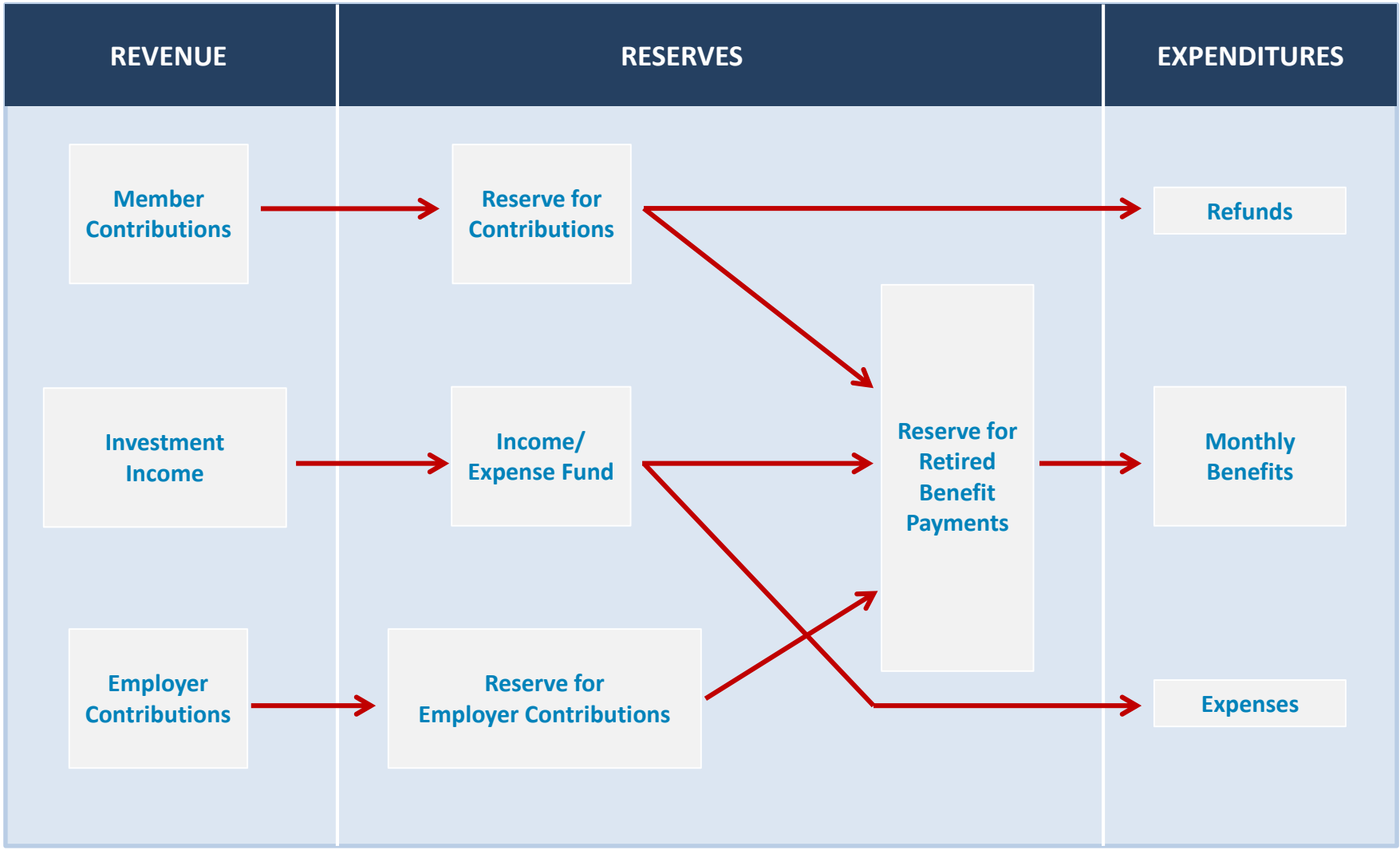


CASH BENEFITS LINE. This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).

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:

	2022	2021	2020	2019	2018
Ratio of actives to retirees and beneficiaries	0.76	0.80	0.84	0.81	0.84
Ratio of retiree actuarial accrued liability to total liability	70%	68%	68%	68%	65%
Ratio of net cash flow to market value of assets	-6%	-5%	-6%	-7%	-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)
6/30/2013 [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
6/30/2022	117,364,059	175,795,934	58,431,875	16,533,707	66.8	709.8	1063.3	353.4

(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.