The General Retirement System of the City of Detroit

Annual Actuarial Valuation of Component I

As of June 30, 2021

800.521.0498 | P: 248.799.9000 | www.grsconsulting.com

March 17, 2022

Board of Trustees
The General Retirement System of the City of Detroit

Re: The General Retirement System of the City of Detroit Actuarial Valuation of Component I as of June 30, 2021

Dear Board Members:

The results of the June 30, 2021 Annual Actuarial Valuation of Component I of the General Retirement System of the City of Detroit (DGRS) are presented in this report.

Based on our understanding, the mandated contribution rates shown on page 1 are in compliance with the Component I Plan and the City's Plan of Adjustment (POA) as approved by the Bankruptcy Court. The amount shown should not be considered a recommendation by the actuary. Users of this report should be aware that contributions made at the POA and Plan required rate do not guarantee benefit security.

The funding level and estimated costs of the Plan shown in this report are based on the actuarial assumptions disclosed in Section F. This report includes some risk metrics on page 6, but does not include a robust assessment of the risks of future experience not meeting the actuarial assumptions. Additional assessment of risks was outside the scope of this assignment. We encourage a review and assessment of investment and other significant risks that may have a material effect on the Plan's financial condition.

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 other parties only in its entirety and only with the permission of the Board. Authorized or unauthorized use of this report by other parties does not create a liability between Gabriel, Roeder, Smith & Company and the other party.

The purpose of the valuation is to measure the System's funding progress and to provide a five-year funding projection. The five-year projection is to assist the Board with its duties related to Section 9.5 of the Combined GRS Plan. 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.

The findings in this report are based on data and other information through June 30, 2021. 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; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period, or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. The scope of an actuarial valuation does not include an analysis of the potential range of such future measurements.

One Towne Square | Suite 800 | Southfield, Michigan 48076-3723

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

The valuation was based upon information furnished by the Retirement System staff, concerning Retirement System benefits, financial transactions, plan provisions and active members, terminated members, retirees and beneficiaries. We checked for internal reasonability and year-to-year consistency, but did not audit the information. We are not responsible for the accuracy or completeness of the information provided by the Retirement System staff. More details are provided in the data section of this report.

This report was prepared using certain assumptions as described in the section of this report entitled Methods and Assumptions. The actuarial cost method is the Entry Age Actuarial Cost Method as prescribed by Section 9.3(1) of the Combined GRS Plan. The assumed rate of return is 6.75% for valuations through June 30, 2023 as prescribed by Section 1.16(3) of the Combined GRS Plan. **Other than the prescribed assumed rate of return, this report reflects the new actuarial assumptions as adopted by the Board and the Investment Committee based on the July 1, 2015 to June 30, 2020 experience study.** The actuarial cost method and assumed rate of investment return of 6.75% are, therefore, prescribed methods and assumptions set by another party as discussed in Actuarial Standard of Practice No. 4. In our judgment, all of the actuarial assumptions used for the valuation are reasonable for purposes of the measurement contained herein.

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 Component I of the General Retirement System of the City of Detroit as of the valuation date. All calculations have been made in conformity with generally accepted actuarial principles and practices and with the Actuarial Standards of Practice issued by the Actuarial Standards Board.

David T. Kausch, Judith A. Kermans, and Jamal Adora are Members of the American Academy of Actuaries (MAAA) and 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

David T Kausch

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

Judith A. Kermans

Judith A. Kermans, EA, FCA, MAAA

Jamal Adora

Jamal Adora, ASA, EA, MAAA

Table of Contents

SECTION A

INTRODUCTION

Executive Summary
($ in Millions)

	June 30, 2021	June 30, 2020
Valuation Date	June 30, 2021	June 30, 2020
Contributions For Fiscal Year Ending	June 30, 2023	June 30, 2022
Employer Contributions		
Mandated Percentage of Covered Payroll	5.00 %	5.00 %
Estimated Annual Amount (Mandated Contributions only)	$ 13.7	$ 13.9
Membership		
Number of:		
Active Members	4,715	5,106
Retirees and Beneficiaries	479	389
Legacy Disabled	108	119
Inactive, Nonretired Members	886	880
Total	6,188	6,494
Valuation Payroll	$ 267.0	$ 271.4
Assets		
Market Value (1)^	$ 213.9	$ 152.6
Return on Market Value (net of administrative expenses)	24.67 %	(2.58)%
Actuarial Information (Assuming 0.5% VPIF)		
Total Normal Cost Rate	7.15 %	7.82 %
Member Contribution Rate	4.00 %	4.00 %
Employer Normal Cost Rate	3.15 %	3.82 %
Actuarial Accrued Liability (2)	$ 205.2	$ 188.1
Unfunded Actuarial Accrued Liability: (2) - (1)	(8.7)	35.5
Funded Ratio: (1) / (2)	104.2%	81.1%
Equivalent Single Amortization Period	0	14
Employer Rate needed for 15-Year Amortization*	3.15%	4.92%
Additional Funding Information (Assuming a full 2.0% VPIF)		
Total Normal Cost Rate	7.81 %	8.67 %
Member Contribution Rate	4.00 %	4.00 %
Employer Normal Cost Rate	3.81 %	4.67 %
Actuarial Accrued Liability (2)	$ 225.9	$ 208.1
Unfunded Actuarial Accrued Liability: (2) - (1)	12.0	55.5
Funded Ratio: (1) / (2)	94.7%	73.3%
Equivalent Single Amortization Period	3	Over 100 Years
Employer Rate needed for 15-Year Amortization*	4.03%	6.53%
Risk Metrics (Assuming 0.5% VPIF)		
Actuarial Accrued Liability Divided by Payroll	0.8	0.7
Market Value of Assets Divided by Payroll	0.8	0.6

^ *Includes $1.2 excess ASF interest transfer from Component II occurring during the year ending June 30, 2020.*

* *We have assumed a minimum 0% UAL contribution.*

Notes: VPIF is the Variable Pension Improvement Factor or ad hoc COLA.

Please see pages 8-11 of the report for important comments regarding valuation results.

Development of Normal Cost and Employer Rates
For Fiscal Year Ending June 30, 2023

Contributions for	General City	D.O.T.	DWSD	Library	System Total
	Contributions Expressed as a Percent of Payroll				
Normal Cost for 0.5% VPIF (COLA):					
Age & Service Pensions	5.25 %	4.52 %	5.09 %	4.78 %	5.13 %
Disability Pensions	0.14 %	0.81 %	0.14 %	0.13 %	0.21 %
Death-in-Service Pensions	0.20 %	0.19 %	0.22 %	0.17 %	0.20 %
Future Refunds	1.01 %	1.09 %	1.02 %	1.06 %	1.02 %
Administrative Expenses	0.59 %	0.59 %	0.59 %	0.59 %	0.59 %
Total	7.19 %	7.20 %	7.06 %	6.73 %	7.15 %
Members Current Contributions#	4.00 %	4.00 %	4.00 %	4.00 %	4.00 %
Employer Normal Cost (0.5% VPIF)	**3.19 %**	**3.20 %**	**3.06 %**	**2.73 %**	**3.15 %**
Additional Normal Cost for Full 2.0% VPIF##	0.65 %	0.64 %	0.65 %	0.59 %	0.66 %
Employer Normal Cost (2.0% VPIF)	**3.84 %**	**3.84 %**	**3.71 %**	**3.32 %**	**3.81 %**
Fixed Employer Rate#	**5.00 %**	**5.00 %**	**5.00 %**	**5.00 %**	**5.00 %**
Amount Available for UAAL % (0.5% VPIF)	**1.81 %**	**1.80 %**	**1.94 %**	**2.27 %**	**1.85 %**
Amount Available for UAAL % (2.0% VPIF)	**1.16 %**	**1.16 %**	**1.29 %**	**1.68 %**	**1.19 %**
Equivalent Single Amortization Period in Years*					
0.5% VPIF	0	0	0	1	0
2.0% VPIF	1	5	6	9	3

\# *Employer contributions are set at 5% of covered compensation per year through plan year 2023, regardless of the funded status of the Plan. Member contributions were initially set at 4.0% of payroll.*

\## *Plan provisions provide criteria for when a COLA can be paid. The current assumption is that on average, over a member's retirement years, they will receive the equivalent of a 0.5% COLA (or VPIF). This is the additional amount for benefits to include a discretionary 2% simple Cost-of-Living Adjustment (COLA) beginning one year after the valuation date. See comments on pages 8-11 for additional details.*

* *Assumes none of the employer contribution is allocated to the Rate Stabilization Fund. Assumes that no future transfers from Component II for Transition Cost are made.*

Development of Liabilities
Retirement System Totals

Valuation Assumptions (1/2% VPIF)

(1)	Present Value of Future Benefits	$	326,692,347
(2)	Present Value of Future Normal Costs		121,481,736
(3)	Actuarial Accrued Liability: (1) - (2)	$	205,210,611
(4)	Accrued Assets		213,893,857
(5)	Unfunded Actuarial Accrued Liability (UAAL): (3) - (4)	$	(8,683,246)
(6)	**Additional Amount for 2% VPIF**		**20,675,970**
(7)	**UAAL for 2% VPIF: (5) + (6)**	**$**	**11,992,724**

COLA Assumption

The COLA or VPIF provided in the Plan is a 2.0% simple post-retirement increase at the beginning of each plan year starting the later of: 1) July 1, 2018; 2) one year after retirement; or 3) age 62. However, Section 9.5 of the Plan imposes several limitations on when the COLA can be paid (or clawed back). For purposes of this report we have assumed that the average COLA is equivalent to 0.5% (unless specified otherwise) and have also shown results assuming a COLA of 2.0%. Future Plan experience, Board policy, and Plan interpretation regarding the administration of Section 9.5 may result in changes to this assumption. If the full 2% VPIF were assumed, the present value of benefits would be $359.4 million and the actuarial accrued liability would be $225.9 million rather than $213.9 million. We understand that the Board and IC are exploring changes to the assumed COLA assumption which we would be happy to assist with.

Contributions Comparative Schedule

Valuation Date June 30	Mandatory Employee Contributions	Employer Contributions for: Normal Cost for 0.5% VPIF (COLA)	Additional Normal Cost for Full 2.0% VPIF (COLA)	Employer Contribution in Excess of Normal Cost&	Amount for UAAL	Amount for Rate Stabilization*	Contributions Effective Fiscal Year	Employer Contribution Type#
2014	4.00%	3.22%	0.81%	0.97%	0.97%	0.00%	2014/15	Mandated
2014	4.00%	3.22%	0.81%	0.97%	0.97%	0.00%	2015/16	Mandated
2015	4.00%	3.17%	0.81%	1.02%	1.02%	0.00%	2016/17	Mandated
2016	4.00%	3.43%	0.82%	0.75%	0.75%	0.00%	2017/18	Mandated@
2017	4.00%	3.55%	0.88%	0.57%	0.57%	0.00%	2018/19	Mandated
2018	4.00%	3.63%	0.87%	0.50%	0.50%	0.00%	2019/20	Mandated
2019	4.00%	3.71%	0.87%	0.42%	0.42%	0.00%	2020/21	Mandated
2020	4.00%	3.82%	0.85%	0.33%	0.33%	0.00%	2021/22	Mandated
2021^	4.00%	3.15%	0.66%	1.19%	TBD	TBD	2022/23	Mandated

& *Employer Contributions are set at 5.0% of covered compensation per year until 2024.*

"Mandated" (Chapter 9.3(2)) if specified by Plan document and POA; "Actuarially Determined" if determined by a valuation based on Board's funding policy.

* *Rate Stabilization Contributions, if any, are determined by the City through 2024.*

@ *The City elected to pay an additional contribution of $3.1 million in June 30, 2018 in an effort to improve the funding position of the System.*

^ *After changes in actuarial assumptions and/or methods.*

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 Plan'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 Risk** – 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 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.

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
Ratio of the market value of assets to total payroll	0.8	0.6
Ratio of actuarial accrued liability to payroll	0.8	0.7
Ratio of actives to retirees and beneficiaries	9.8	13.1
Ratio of net cash flow to market value of assets	0.1	0.2
Duration of the actuarial accrued liability	20.1	22.1

Ratio of Market Value of Assets to Payroll

The relationship between assets and payroll is a useful indicator of the potential volatility of contributions. For example, if the market value of assets is 2.0 times the payroll, a return on assets 5% different than assumed would equal 10% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in plan sponsor contributions as a percentage of payroll.

Ratio of Actuarial Accrued Liability to Payroll

The relationship between actuarial accrued liability and payroll is a useful indicator of the potential volatility of contributions for a fully funded plan. A funding policy that targets a funded ratio of 100% is expected to result in the ratio of assets to payroll and the ratio of liability to payroll converging over time.

The ratio of liability to payroll may also be used as a measure of sensitivity of the liability. For example, if the actuarial accrued liability is 2.5 times the payroll, a change in liability 2% other than assumed would equal 5% of payroll. A higher (lower) or increasing (decreasing) level of this maturity measure generally indicates a higher (lower) or increasing (decreasing) volatility in liability (and also plan sponsor contributions) as a percentage of payroll.

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 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.

Duration of Actuarial Accrued Liability

The duration of the actuarial accrued liability may be used to approximate the sensitivity to a 1% change in the assumed rate of return. For example, a duration of 10 indicates that the liability would increase approximately 10% if the assumed rate of return was lowered 1% and a duration of 20 indicates that the liability would increase approximately 20% of the assumed rate of return was lowered 1%.

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, and stress tests. After issuing this valuation, we will update a projection tool that can be used for additional risk assessment, at the Board request.

Comments

Comment 1 – Transition Cost

The Transition Cost is defined in Section E-16 of the Combined Plan as the accrued liability at plan inception due to vesting and eligibility service earned prior to the Component I effective date (July 1, 2014). While Transition Costs are not isolated in the main valuation, they are used in the projections performed for Section 9.5 of the Plan. The Board has adopted a VPIF assumption of 0.0% for determining the Transition Costs. The Transition Costs have a potential source of funding separate from employer and employee contributions. However, to the extent that the potential separate source of funding does not materialize (or is not sufficient) then the Transition Costs will have to be funded by future employer and employee contributions to the Component I Plan.

The fund is more than 100% funded using a 0.0% VPIF assumption. However, there does not currently exist a policy that allocates that unfunded amount between Transition Costs and non-Transition Costs. Since future excess interest transfers are affected by whether or not the Transition Costs are fully funded, we recommend that the Board adopt a method of allocating any unfunded amounts (after exclusion of the RSF) between Transition Costs and other liabilities. If the Board wishes, we can work with legal counsel and suggest a few methods for consideration and discuss the advantages and disadvantages with the Board.

For purposes of this valuation we have assumed the Transition Cost is fully funded as of June 30, 2021. Based on our understanding of the POA, this would mean that 100% of ASF Return Excess occurring as a result of FY 2021 returns would be transferred to the Component I Pension Accumulation Fund and that 50% of ASF Return Excess occurring as a result of FY 2022 and beyond returns would be transferred to the Component I Rate Stabilization Fund. This understanding is subject to legal review. For this Component I (Hybrid) valuation, this assumption only affects the Section 9.5 projections. In regards to the remedial actions required by Section 9.5, the funded status of the Transition Cost would not have an effect on the remedial actions determined in this valuation. Note that in the Section 9.5 projections, the Transition Cost is scheduled to be fully amortized by June 30, 2023 under current Board procedures.

Comment 1a – ASF Transfers

The Plan requires that, in the event that the rate of interest credited to the Annuity Savings Fund (ASF) of the Component II (Legacy) Plan is less than the rate earned by the Component II trust, a transfer of the difference in rates (applied to the Component II ASF balance) to the Component I trust may occur to fund the Transition Cost. If Transition Costs are fully funded, then only 50% of the difference is transferred to Component I. Transfers cease after June 30, 2023. With the exception of the Section 9.5 projections, for purposes of this valuation future transfers were assumed not to occur.

Based on the investment performance for the year ending June 30, 2020, we do not expect a transfer to occur in FY 2022. However, based on the investment performance for the year ending June 30, 2021, we expect an estimated transfer of $21.8 million to occur in FY 2023.

We recommend that the Board set up an alternate plan for funding the Transition Cost in case future transfers are not sufficient to fund the remaining Transition Cost.

Comments

Comment 2 – Fiscal Responsibility Test

The five-year projections required under Section 9.5 of the plan (Titled Fiscal Responsibility) are shown in Section C of this report, which starts on page 16. The projections are based on the assumptions and methods adopted by the Board, as detailed on page 16. The results of the projections are shown on page 18 and indicate that the plan is projected to be 126% funded in five years. Since the projected funded status is greater than 100% in five years, we believe Board action described under Section 9.5 (1) of the plan may not be required. Since the projected funded status is above 80% in five years, we believe Board action described under Section 9.5 (2) of the plan may not be required. We recommend that the Board consult with legal counsel to determine which Board actions are required by the Plan. Section 9.5 is reproduced in this report on page 19 for convenience.

Comment 2a – Fiscal Responsibility Test

July 1, 2018 was the first year that the Board was allowed to provide post-retirement increases to retired members who qualify under the VPIF section of the Plan (Section 6.2 Variable Pension Improvement Factor). We believe the Board has implemented a 2-year delay between the valuation date on which the projection is performed and the actions resulting from the projection. Since the projected funded status of the plan in 5 years is more than 100% under the Section 9.5 projection, it appears the Board may grant a VPIF on July 1, 2023. We recommend the Board consult with legal counsel regarding this issue.

Comment 3 – Funding

Mandatory Employee contributions are initially set to 4.0% of compensation but can be increased if necessary to maintain funding levels at 100%. Employer contributions are set at 5.0% of payroll through June 30, 2023. Employer contributions are actuarially determined beginning in FY 2024 (June 30, 2022 valuation) to be the amount necessary to fund the Plan on an actuarial basis. The 5% of payroll employer contribution rate exceeds the normal cost rate of 3.15% of payroll by 1.85% of payroll (when the normal cost rate is based on the valuation assumption of a 0.5% VPIF).

	(1) Employer Normal Cost Rate	(2) Employer Rate	(3) Excess (2)-(1)	(4) UAAL	(5) Amortization Period
Valuation Assumptions (0.5% VPIF)	3.15%	5.00%	1.85%	($ 8.7) mill.	0
Full 2% VPIF	3.81%	5.00%	1.19%	$ 12.0 mill.	3

The Plan anticipates another funding source for the Transition Cost portion of the UAAL. In the event that the rate of interest credited to the Annuity Savings Fund (ASF) of the Component II (Legacy) Plan is less than the rate earned by the Component II trust, a transfer of the difference in rates (applied to the Component II ASF balance) to the Component I trust may occur to help fund transition liabilities. Transfers cease after June 30, 2023. For purposes of this valuation, future transfers were assumed not to occur. See Comment 1a for additional information regarding expected transfers in the near future. To date, the following transfers have been made:

- $9,015,677 in fiscal year 2019
- $1,178,130 in fiscal year 2020

Employer contributions after June 30, 2023 will be actuarially determined.

Comment 3a – Funding

The City has elected to make an additional contribution (above what is required by the Plan) of $2.69 million on or before June 30, 2022 to improve the Plans funding status. We commend the City's decision. This anticipated contribution has been considered in determining the illustrative 15-year amortization, the single equivalent, amortization periods, and the 5-year projection in Section C. It is not reflected in the assets or UAAL as of June 30, 2021, since it will be contributed after the valuation date. For purposes of determining illustrative contribution rates by division, we assumed this contribution would be allocated in proportion to division assets.

Comment 4 – RSF

It is our understanding of the Plan that the amount of employer contributions credited to the Rate Stabilization Fund (RSF) is at the discretion of the Employer. We have been informed that the Employer has directed that none of the Employer contributions for FY 2015 through FY 2021 be credited to the RSF.

Comment 5 – Actuarial Assumptions

The assumed rate of return prescribed by the POA is 6.75%, net of investment expenses. We have reviewed the reasonableness of this assumption based on the Plan's investment policy and our Capital Market Assumption Modeler. The analysis depends on the underlying price inflation and the rate of administrative expenses. Based on our analysis, the prescribed 6.75% rate of return is reasonable for the purpose of the measurement being taken.

There were numerous assumption changes made as a result of the 2020 Experience Study. These changes included the following:

- The Assumed Rate of Return was changed from 6.75% net of Administrative Expenses to 6.75% gross of Administrative Expenses with an explicit assumption of a 0.59% of pay Administrative Expense.
- Mortality was updated from versions of RP-2014 with fully generational mortality improvements using MP-2014 to versions of Pub-2010 mortality tables with fully generational mortality improvement using MP-2021.
- Other Demographic assumptions related to withdrawals, disabilities, normal retirement, early retirement, and merit and longevity pay increases were updated.

The total effect of all these assumptions was to decrease the UAAL by 5.2 million. For a full description of the assumptions used see section F starting on page 33.

We understand that the Board may continue to explore changes in the assumed rate of return and COLA. However, per legal counsel, we also understand that for the annual actuarial valuation the 6.75% assumed rate of return cannot be changed until the June 30, 2024 actuarial report, including for purposes of calculating the actuarially determined contribution.

We anticipate the next comprehensive review of experience to cover the period from July 1, 2020 to June 30, 2025. We encourage the Board to review and possibly lower the assumed rate of return before the next experience study.

Comment 6 – Plan Experience

Plan experience was favorable in the year ending June 30, 2020. The plan experienced a net gain of $41.6 million consisting of a net liability gain of $12.4 million and asset gain of $29.2 million. The liability gains were driven in large part by significantly more terminations than expected. Additional information about gains and losses is shown on page 15. The $29.2 million asset gain is due to investment returns greater than expected (actual market return of 24.67% compared to an expected return of 6.75%).

In addition, covered payroll fell by approximately 1.6%, compared to an assumed increase of 2.5%. While continuing members' salaries rose less than expected, the decrease was mostly due to less newly hired covered actives than expected. The large deficiency in new members replacing terminating members results in the fixed contribution generating less revenue and raising the effective amortization period.

Comment 6a – Temporary Service Reductions

One aspect of plan experience discussed in comment 6 is a liability gain due to service accruals. Service accruals during the year were less than expected. We understand that the City implemented two COVID related programs: 1) a workshare program that results in employees not working enough hours in a month to earn credited service and 2) furloughs. Since the workshare program was in effect during the plan year it likely has an impact on this valuation (based on the data supplied for a supplemental valuation of the work share program).

Comment 7 – Funding Policy

We are currently working with the Board to assist them in the development of a funding policy for this plan. **We strongly recommend that the Board and Investment Committee adopt a funding policy in the next few months so that the funding policy can be incorporated in the June 30, 2022 valuation.**

Comment 8 – New Data System

We understand that the Retirement System is in the process of moving to a new data system and that future valuation data will be provided from that system beginning with the 2022 or 2023 valuation. We also understand that data may have gone through additional cleaning/auditing as it has been entered into the new system. We anticipate that data will be more precise for valuation purposes once the new system is providing that data. Please note that changes in data may impact future valuation results and generate gains or losses.

Comment 9 – Option Factors

The Board adopted new option factors for the Plan based on the mortality study completed in 2015. We have not been provided with a specific effective date for the new factors. However, we understand the intent is to implement the new factors with the new data system. For the sake of simplicity, we have assumed the new factors apply to all retirements after the valuation date. We will continue to work with the System in the calculation of optional forms of payment. In particular, the Board may want to consider updating the assumptions used in optional forms of payment in order to recognize recent changes to the assumptions used in the annual actuarial valuations.

Comment 10 – EMT

Based on our discussions with System staff, we understand that future EMT will go into in the Police and Fire Retirement System (PFRS) and that current EMT members may elect to enter the PFRS but that it would be unlikely for current members to elect to transfer to the PFRS. We have assumed that no current EMT members would elect to transfer to the PFRS.

SECTION B

FUNDING RESULTS

Actuarial Liabilities
as of June 30, 2021

Actuarial Present Value of	Total Present Value	Portion Covered by Future Normal Cost Contributions	Actuarial Accrued Liabilities (1) – (2)
Age and service allowances based on total service likely to be rendered by present active members	$198,328,339	$ 65,723,990	$132,604,349
Disability benefits likely to be paid to present active members	6,318,757	3,848,629	2,470,128
Death-in-service benefits likely to be paid on behalf of present active members	8,219,179	3,740,703	4,478,476
Separation benefits (refunds of contributions and deferred allowances) likely to be paid to present active members	53,529,748	48,168,414	5,361,334
Benefits attributed to voluntary member contributions	33,233,074	0	33,233,074
Reserve for Refunds Due	0	0	0
Benefits likely to be paid to vested inactive members	10,842,107	0	10,842,107
Benefits to be paid to current retirees, beneficiaries, and future beneficiaries of current retirees (including annuities)	16,221,143	0	16,221,143
Total (0.5% VPIF)	$326,692,347	$ 121,481,736	$205,210,611
Actuarial Value of Assets	$213,893,857	$ 0	$213,893,857
Liabilities to be covered by Future Contributions	$112,798,490	$ 121,481,736	$ 0
Additional Amount for Full (2.0%) VPIF	32,749,324	12,073,354	11,992,724
Liabilities to be covered by Future Contributions for Full VPIF	$145,547,814	$ 133,555,090	$ 11,992,724

Actuarial Balance Sheet
(0.5% VPIF)

Assets and Present Value of Expected Future Contributions

Valuation Date (June 30):	2021
A. Present Actuarial Value of Assets	
1. Net assets from System financial statements	$ 213,893,857
2. Adjustment for Valuation Assets	0
3. Actuarial Value of Assets	213,893,857
B. Actuarial Present Value of Expected Future Employer Contributions	
1. For Normal Costs	46,781,123
2. For Unfunded Actuarial Accrued Liability	(8,683,246)
3. Total	38,097,877
C. Actuarial Present Value of Expected Future Member Contributions	74,700,613
D. Total Present and Expected Future Resources	$ 326,692,347

Present Value of Expected Future Benefit Payments

A. To Retirees and Beneficiaries (Including Annuities)	$ 16,221,143
B. To Vested Terminated Members	10,842,107
C. To Present Active Members	
1. Allocated to Service Rendered Prior to Valuation Date – Actuarial Accrued Liability	144,914,287
2. Allocated to service likely to be rendered after valuation date	121,481,736
3. Total	266,396,023
D. Voluntary Member Contributions	33,233,074
E. Total Actuarial Present Value of Expected Future Benefit Payments	$ 326,692,347

Liability by Division

Present Value, June 30 of	General	D.O.T.	DWSD	Library	Totals
Accrued Pension Liabilities					
Retirees and beneficiaries	$ 8,232,787	$ 2,779,829	$ 3,691,108	$ 1,020,022	$ 15,723,746
Inactive members future deferred pensions	4,734,947	2,471,646	3,322,678	312,836	10,842,107
Active members	100,326,492	19,111,663	17,331,823	8,144,309	144,914,287
Total accrued pension liabilities	113,294,226	24,363,138	24,345,609	9,477,167	171,480,140
Pension fund balances	121,520,713	25,317,588	24,691,975	8,990,572	180,520,848
Additional Amount for Full VPIF	13,685,193	2,958,651	2,910,933	1,121,193	20,675,970
Full VPIF accrued liability	126,979,419	27,321,789	27,256,542	10,598,360	192,156,110
Accrued Annuity Liabilities (Due to Voluntary Member Contributions)					
Retirees and beneficiaries	$ 436,216	$ 11,018	$ 50,163	$ -	$ 497,397
Members annuities & future refunds	20,328,143	8,755,723	3,937,852	211,356	33,233,074
Total accrued annuity liabilities	20,764,359	8,766,741	3,988,015	211,356	33,730,471
Annuity fund balances	20,429,341	8,755,255	3,977,057	211,356	33,373,009
Unfunded accrued annuity liabilities^	335,018	11,486	10,958	-	357,462
Totals					
Actuarial Accrued Liabilities	$ 134,058,585	$ 33,129,879	$ 28,333,624	$ 9,688,523	$ 205,210,611
Accrued Assets*	141,950,054	34,072,843	28,669,032	9,201,928	213,893,857
Funded Ratio	105.9%	102.8%	101.2%	95.0%	104.2%
Unfunded Actuarial Accrued Liabilities (0.5% VPIF)	**$ (7,891,469)**	**$ (942,964)**	**$ (335,408)**	**$ 486,595**	**$ (8,683,246)**
Additional Amount for Full (2.0%) VPIF	**13,685,193**	**2,958,651**	**2,910,933**	**1,121,193**	**20,675,970**
UAAL at Full VPIF	**$ 5,793,724**	**$ 2,015,687**	**$ 2,575,525**	**$ 1,607,788**	**$ 11,992,724**

** Assets are allocated by division by System Staff.*
^ A break out of assets set to pay for annuitized Voluntary Member Contributions was not provided.

Totals may not add due to rounding.

The funded status measure is not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations. The funded status is appropriate for assessing the need for future UAAL contributions if all actuarial assumptions are met.

Development of Actuarial Gain or Loss
(0.5% VPIF BOY)

		Actuarial Accrued Liability (AAL) (A)	Actuarial Value of Assets^ (B)	Unfunded Actuarial Accrued Liability (C) = (A) - (B)
(1)	Beginning of Year (BOY)	$ 188,081,553	$ 152,560,705	$ 35,520,848
(2)	Total Normal Cost*	26,407,616	N/A	26,407,616
(3)	Total Contributions	N/A	26,208,251	(26,208,251)
(4)	Benefit Payments and Refunds	(5,118,405)	(5,118,405)	-
(5)	Interest 6.75% x (1) + 6.75% x [(2) + (3) + (4)] / 2	13,414,016	11,009,630	2,404,386
(6)	Expected End of Year Before Changes (1)+(2)+(3)+(4)+(5)	$ 222,784,779	$ 184,660,181	$ 38,124,598
(7)	Assumption Changes	(5,222,095)	-	$ (5,222,095)
(8)	Benefit Changes	-	-	-
(9)	Expected End of Year After Changes (6)+(7)+(8)	$ 217,562,684	$ 184,660,181	$ 32,902,503
(10)	Actual End of Year	205,210,611	213,893,857	(8,683,246)
(11)	Gain or Loss (6)-(7)	$ 12,352,073 Gain	$ (29,233,676) Gain	$ 41,585,749 Gain
(12)	Percent of BOY AAL (9)/(1A)	6.57%	(15.54)%	22.11%

** Normal Cost is based on the prior valuation and includes current year voluntary member contributions.*
^ Actuarial Value of Assets equals Market Value of Assets (no asset smoothing).

Type of Risk Area	Gain (Loss) in Period* Totals ($ in millions)	Gain (Loss) in Period* Percent of Beginning of Year Liabilities
Data Changes^	$ 5.2	2.8 %
Excess Interest Transfers	0.0	0.0 %
Risks Related to Assumptions		
Economic Risk Areas:		
Pay Increases	1.5	0.8 %
Investment Return	29.2	15.5 %
VPIF	0.0	0.0 %
Demographic Risk Areas:		
Full and Reduced Service Retirements	(1.5)	(0.8)%
Death Benefits	(0.0)	0.0 %
Disability Benefits	0.1	0.1 %
Other Terminations	6.3	3.3 %
Post-Retirement Mortality	0.8	0.4 %
Other	0.0	0.0 %
Total Gain (or Loss) During Period	41.6	22.1 %

* *Results are approximate due to limitations in data.*
^ *Includes changes in service other than one year.*

SECTION C

FIVE-YEAR FUNDED STATUS PROJECTIONS

Section 9.5, Fiscal Responsibility, of the Combined GRS Plan contains several provisions for adjusting contributions and/or benefits to be determined based on a 5-year projection of the funded status of the plan. This section calls for two different funded status projection tests:

- Section 9.5(1) test for the funded status falling below 100%; and
- Section 9.5(2) test for the funded status falling below 80%.

Section 9.5(2) specifically states that actions taken under Section 9.5(1)(a) should be reflected in the projections but that actions taken under Section 9.5(1)(b) and 9.5(1)(c) should be excluded in the projections. Section 9.5(3) specifies the interest rate to be used in the projections. Other assumptions used in the projections were adopted by the Board based on the recommendation of the Investment Committee and are summarized below:

- The five-year projections are based on the general valuation assumptions as previously adopted by the Board (e.g., inflation, mortality, retirement, withdrawal, etc.).
- The VPIF is assumed to be 0% and the Transition Cost should assume 0% VPIF and should be excluded from the projected liabilities based upon a 9-year level dollar amortization as of 2014.
- Component II ASF balances are assumed to be withdrawn as a level dollar amount over the next 10 years, however voluntary employee contributions into the Component I Annuity Savings Fund shall be assumed to continue at the historical levels as previously contributed to the Component II ASF.
- For Transition Cost funding purposes, the difference between the assumed rate of investment return of 6.75% and the maximum interest rate that can be credited to the ASF Accounts of 5.25% should be used for both the Component I and Component II ASF Accounts. However, for asset transfers based on a lookback period, actual market returns will be used, if known.
- The Component I assets shall include the Rate Stabilization Fund to the extent the plan is less than 100% funded.
- The Annual Actuarial Valuation for the fiscal year ending June 30, 2015 shall generate the first five-year projection. Upon receipt of the June 30, 2015 valuation, a determination shall be made whether any remedial action is required. In the event remedial action is required, such remedial action shall be effective July 1, 2017. Subsequent valuations will follow the corresponding schedule.
- The funding value of plan assets for purposes of Section 9.5 testing of the Component I plan funding level shall be based upon the market value of assets on the valuation date and projected based on an assumed 6.75% rate of return for each of the 5 years in the projection period.
- Methods and assumptions are the same for both tests.
- 5% of payroll employer contributions.
- 4% of payroll member contributions.
- Voluntary employee contributions are included in both the assets and the liabilities.

Transition Cost

Under the current actuarial cost method, members with past vesting service generated an initial liability as of June 30, 2014. This is the "Transition Cost" described in Section E-16 of the Combined GRS Plan. A separate funding source was established for the Transition Cost through 2023. The projections net the Transition Cost out of the Actuarial Accrued Liability to determine projected funded status. As directed by the Board, Projected Transition Cost is based on the 9-year level dollar amortization of the initial Transition Cost amount and the initial Transition Cost amount is based on a 0.0% VPIF. An amortization schedule of the Transition Cost follows. Note, under this method any future gains or losses related to the Transition Cost would be accounted for in the Actuarial Accrued Liability net of Transition Cost as they occur.

Transition Cost Amortization Schedule

Calculated Using a Level Dollar Amortization (mid-year payments)
and an Investment Return Assumption of 6.75% Compounded Annually
9-Year Closed Amortization (based on 0.0% VPIF)

Valuation Date June 30	Fiscal Year June 30	Transition Cost at Beginning of Year	Annual Contributions During Fiscal Year Dollars	Transition Cost at End of Year
2014	2015	$ 38,679,331	$ 5,685,036	$ 35,416,412
2015	2016	35,416,412	5,685,036	31,933,247
2016	2017	31,933,247	5,685,036	28,214,968
2017	2018	28,214,968	5,685,036	24,245,704
2018	2019	24,245,704	5,685,036	20,008,516
2019	2020	20,008,516	5,685,036	15,485,318
2020	2021	15,485,318	5,685,036	10,656,803
2021	**2022**	**10,656,803**	**5,685,036**	**5,502,364**
2022	2023	5,502,364	5,685,036	0

To the extent that actual funding of the Transition Cost differs from this schedule, gains and losses will accumulate in the Plan's unfunded actuarial accrued liability.

Projected Funded Status

Illustrative with Estimated FY22 and FY23 Transfers Based on FY20 and FY21 Actual Investment Returns
5-Year Projection Assuming 6.75% Investment Return in all Future Years - No (0%) VPIF (COLA)

		A	B	C = (A - B)	D	E = (D/C)
Valuation Date June 30,	Fiscal Year June 30,	Total AAL	Transition Cost	Net AAL	Assets	Net Funded Ratio
2021	2022	$ 198,318,438	$ 10,656,803	$ 187,661,635	$ 213,893,857	114%
2022	2023	228,286,840	5,502,364	222,784,477	254,518,374	114%
2023	2024	260,119,260	-	260,119,260	317,846,693	122%
2024	2025	294,050,844	-	294,050,844	363,152,920	124%
2025	2026	330,005,172	-	330,005,172	411,548,675	125%
2026	2027	368,111,661	-	368,111,661	462,362,301	**126%**

Comment 1: Based on this projection, the Funded Status is above 100% by the end of the 5-year projection. **We believe this result means Board action under Section 9.5(1)(a), 9.5(1)(b), and 9.5(1)(c) are not required.** We recommend the Board consult with legal counsel to confirm.

Comment 2: Based on this projection, the Funded Status is at or above 80% by the end of the 5-year projection. **We believe this result means the Board actions under Section 9.5(2) are not required.** We recommend the Board consult with legal counsel to confirm.

Comment 3: Based on the investment performance for the year ending June 30, 2020 and June 30, 2021, we have estimated the transfer to fund Transition Costs to be approximately $0 in FY21 $21.8 million in FY22. Consistent with the assumptions adopted by the Board, the estimated transfers are included in the above projection

Comment 4: The funded status of the Transition Cost determines the amount of ASF Return Excess credited to Component I. For purposes of this valuation we have assumed the Transition Cost is fully funded as of June 30, 2021. Based on our understanding of the POA, this would mean that 100% of ASF Return Excess occurring as a result of FY 2021 returns would be transferred to the Component I Pension Accumulation Fund and that 50% of ASF Return Excess occurring as a result of FY 2022 and beyond returns would be transferred to the Component I Rate Stabilization Fund. This understanding is subject to legal review. For this Component I (Hybrid) valuation, this assumption only effects the Section 9.5 projections. In regards the remedial actions required by Section 9.5, the funded status of the Transition Cost would not have an effect on the remedial actions determined in this valuation.

History of VPIF Granted to Retirees

Plan Year beginning July 1 of	Actual*	Assumed
(1)	(2)	(3)
2014	0.0%	0.0%
2015	0.0%	0.0%
2016	0.0%	0.0%
2017	0.0%	0.0%
2018	0.0%	0.5%
2019	0.0%	0.5%
2020	0.0%	0.5%
2021	0.0%	0.5%

** First increase could not be granted until July 1, 2018.*

Section 9.5 in its entirety is shown below:

Sec. 9.5. Fiscal Responsibility: Increased Funding Obligations and Benefit Reductions

(1) To safeguard the long-term actuarial and financial integrity of the Retirement System, in the event the funding level of Component I of the Retirement System projected over a five-year period falls below one hundred percent (100%), the following remedial action shall be required in the order set forth below, beginning with the Plan Year following the Plan Year in which such determination is made and continuing until the funding level is restored to not less than one hundred percent (100%):

(a) the Trustee may not award the variable pension improvement factor (escalator) described in Section 6.2 to any Retiree;
(b) all amounts credited to the Rate Stabilization Fund shall be transferred to the Pension Accumulation Fund for the purposes of funding benefits payable under Component I of the Retirement System; and
(c) Member Mandatory Employee Contributions shall be increased from four percent (4%) of Compensation to five percent (5%) of Compensation for up to the next following five Plan Years.

(2) In the event the funding level of Component I of the Retirement System determined as provided in Section 9.5(1) is projected to fall below eighty percent (80%), the following remedial action shall be required in the order set forth below, beginning with the Plan Year following the Plan Year in which such determination is made and continuing until the funding level is projected to be not less than eighty percent (80%) on a market value basis within the next five years:

(a) the remedial action required in Section 9.5(1) shall be implemented or continued;
(b) the Retirement Allowance payable to a Retiree shall not include the variable pension improvement factor (escalator) that was most recently added to the Retiree's Retirement Allowance for a Plan Year;
(c) Member Mandatory Employee Contributions shall be increased from five percent (5%) of Compensation to six percent (6%) of Compensation for up to the next following five Plan Years;
(d) the Retirement Allowance payable to a Retiree shall not include the variable pension improvement factor (escalator) that was most recently added to the Retiree's Retirement Allowance for the Plan Year preceding the Plan Year referenced in paragraph (b) above; and
(e) the Retirement Allowance accrued by Members for up to the next five Plan Year period shall be determined as provided in Section 6.1, except that one percent (1 %) shall be substituted for one and one-half percent (1.5%) wherever it appears in said Section 6.1.

In determining whether the eighty percent (80%) funding level under this Section 9.5(2) has been achieved, the Plan's Actuary shall calculate the funding percentage of the Retirement System after taking into account the elimination of the variable pension improvement factor (escalator) pursuant to Section 9.5(1)(a) but prior to taking into account the remedial steps provided in Sections 9.5(1)(b) and (c).

(3) For purposes of this Section 9.5, the "funding level" of Component I of the Retirement System shall mean the ratio of the market value of the assets of Component I of the Retirement System to the actuarial accrued liability of Component I of the Retirement System. The actuarial accrued liability shall be calculated by the Plan's Actuary utilizing an interest rate assumption of six and three-quarters percent (6.75%) and other reasonable assumptions as directed by the Board upon the recommendation of the Investment Committee. The market value of assets shall be determined on the basis of a three-year look back period of smoothed investment returns.

SECTION D

FUND ASSETS

Statement of Plan Assets
(Assets at Market or Fair Value)

Item	June 30, 2021	June 30, 2020
A. Cash and cash equivalents	$ 4,203,304	$ 63,276,170
B. Receivables:		
1. Investment income	201,155	88,413
2. Contributions	2,814,486	2,682,035
3. Receivables from investment sales	363,146	184,954
4. Other	510,483	2
5. Total Receivables	$ 3,889,270	$ 2,955,404
C. Investments		
1. Global equities	$ 98,246,942	$ 22,052,122
2. Global fixed income	46,988,043	17,676,395
3. Real estate	24,821,447	21,730,976
4. Private equity	12,963,415	9,481,234
5. Diversifying strategies	22,159,387	14,941,442
6. Total Investments	$ 205,179,234	$ 85,882,169
D. Other Assets	$ 10,630,977	7,178,426
E. Liabilities	$ 10,008,928	$ 6,731,464
F. Total Market Value of Assets Available for Benefits	$ 213,893,857	$ 152,560,705
G. Voluntary Member Contributions	$ 33,233,074	$ 29,508,796
H. Market Value Net of Voluntary Member Contributions	$ 180,660,783	$ 123,051,909

The above schedule shows results for the Hybrid (Component I) plan **only.** We understand that, for purposes of determining investment return, Hybrid and Legacy assets are comingled and that resulting investment return is prorated between the two plans proportionate to the total assets within each system.

Plan Assets by Fund and Division
(Assets at Market or Fair Value)

	June 30, 2021	June 30, 2020
Voluntary Employee Contribution		
General	$ 20,328,143	$ 17,139,325
D.O.T.	8,755,723	8,357,967
DWSD	3,937,852	3,849,569
Library	211,356	161,935
Totals	33,233,074	29,508,796
Mandatory Employee Contribution		
General	36,706,328	30,926,512
D.O.T.	6,449,063	5,776,157
DWSD	7,315,340	6,443,258
Library	2,684,280	2,432,137
Totals	53,155,011	45,578,064
Pension Accumulation Fund		
General	84,814,385	51,198,408
D.O.T.	18,868,525	11,199,117
DWSD	17,376,635	10,782,452
Library	6,306,292	4,258,761
Totals	127,365,837	77,438,738
Annuity Reserve Fund		
General	101,198	16,534
D.O.T.	-468	1,243
DWSD	39,205	17,330
Library	0	0
Totals	139,935	35,107
Retirement System Totals	$213,893,857	$152,560,705

Reconciliation of Plan Assets

Item	June 30, 2021	June 30, 2020
A. Market Value of Assets at Beginning of Year	$ 152,560,705	$ 130,263,912
B. Revenues and Expenditures		
1. Contributions		
a. Member Contributions	$ 14,517,267	$ 15,929,752
b. Employer Contributions	11,690,984	12,515,862
c. State Contributions	0	0
d. Purchased Service Credit	0	0
e. Total	$ 26,208,251	$ 28,445,614
2. Investment Income		
a. Interest, Dividends, and Other Income	$ 3,426,914	$ 5,390,218
b. Net Realized and Unrealized Gains/(Losses)	39,019,655	(7,001,014)
c. Investment Expenses	(919,076)	(605,372)
d. Net Investment Income	$ 41,527,493	$ (2,216,168)
3. Benefits and Refunds		
a. Refunds	$ 4,131,674	$ 2,898,553
b. Regular Monthly Benefits	986,731	731,280
c. Partial Lump-Sum Benefits Paid	0	0
d. Other	0	0
e. Total	$ 5,118,405	$ 3,629,833
4. Administrative and Miscellaneous Expenses	$ 1,316,432	$ 1,540,433
5. Other	$ 32,245	$ 59,483
6. Transfers	$ 0	$ 1,178,130
C. Market Value of Assets at End of Year	$ 213,893,857	$ 152,560,705

Reconciliation of Plan Assets by Fund

	Pension Accumulation Fund	Mandatory Employee Contribution Fund	Voluntary Employee Contribution Fund	Annuity Reserve Fund	Total Funds
Balance July 1, 2020	$ 77,438,738	$ 45,578,064	$ 29,508,796	$ 35,107	$ 152,560,705
Adjustment	-	-	-	-	-
Restated Balance July 1, 2020	77,438,738	45,578,064	29,508,796	35,107	152,560,705
Revenues					
Member contributions	-	9,333,976	5,183,291	-	14,517,267
Employer contributions	11,690,984	-	-	-	11,690,984
Other	32,245	-	-	-	32,245
Transfer In	-	-	-	139,750	139,750
Recognized investment income	40,472,111	-	1,055,382	-	41,527,493
Total	$ 52,195,340	$ 9,333,976	$ 6,238,673	$ 139,750	$ 67,907,739
Expenditures					
Benefit payments	951,809	-	-	34,922	986,731
Refund of member contributions	-	1,757,029	2,374,645	-	4,131,674
Transfer Out	-	-	139,750	-	139,750
Administrative expenses#	1,316,432	-	-	-	1,316,432
Total	$ 2,268,241	$ 1,757,029	$ 2,514,395	$ 34,922	$ 6,574,587
Balance, June 30, 2021	$ 127,365,837	$ 53,155,011	$ 33,233,074	$ 139,935	$ 213,893,857

SECTION E

PARTICIPANT DATA

Summary of Participant Data as of June 30, 2021

Actives

A) Count Reported on file	5,788
B) Deferreds - "AnnSt" = "F"	-
C) Non-active status	(1,017)
D) Agency "88"	(28)
E) Non-eligible class code & bargaining unit	(6)
F) Hired after val date	(6)
G) No date of hire on file	-
H) No salary on file	(16)
I) Actives	4,715

Retired

A) Number of records reported on data file	45,058
B) Number of records in P/F plan	(16,857)
C) Records not currently in receipt of benefits based on reported status codes	(16,549)
D) Coded as Legacy records	(11,173)
E) Number of records valued	479

Deferred

A) Number of records reported on data file	1,123
B) Retired (normal or early) in Legacy post 6/30/14 but not in Hybrid retiree file. Also has non-zero contribution balance.	331
C) Valued as a vested active member in prior year but not in this year's active file and would not have otherwise been valued in Hybrid this year	87
D) Deceased	-
E) Zero hybrid service	(183)
F) Less than 10 years of vesting service	(143)
G) Zero mandatory contribution balance	(308)
H) Terminated before 6/30/2014	(21)
I) Number of records to value	886

Notes:

In addition to the above, we have included liabilities for 108 members that were reported as Component II (Legacy) duty disabilities. These members were less than age 62 and did not have a corresponding Component I (Hybrid) record. They have all either not converted in Legacy or converted to Legacy after June 30, 2018.

Active Row C: The Active data file contains a field titled “Stat.” Active members were only valued if the record for this field had a value of “1.” In 2021, members were also valued if this field had a status of “71” (LOA).

Active Row D: Agency “88” is the 36th District Court. We understand that members in that agency are not eligible to receive benefits.

Active Row E: For both this valuation and the prior valuation, we have received a separate list of Class Codes and Bargaining Units that are not eligible to receive benefits.

Retired Row C: The Retired Life file has a field named “STATUS.” We understand that if this field is populated with a number that is one or greater, the member is no longer receiving a benefit and should not be valued.

Deferred Row F: Service provided in the data file is benefit service. Vesting service was determined by taking service in the Legacy inactive file.

Deferred Row G: Assumed to have refunded and forfeited Hybrid defined benefit.

Reconciliation

	Active		Term.	Retirees		Totals
	Count	Pay	Count	Count	Monthly Benefits	Count
2020	**5,106**	**$271,410,800**	**880**	**389**	**$64,493**	**6,375**
Change in Pay/Pensions	N/A	11,759,616	N/A	N/A	(3,043)	
New	485	23,859,422	14			485
New Beneficiary				1	313	1
Retired	(62)	(2,921,375)	(34)	96	24,420	-
Non-Duty Disabled				-	-	-
Duty Disabled				-	-	-
Assumed Death/Removals			(81)	(5)	(880)	(86)
Vested Terminated	(172)	(8,116,560)	139			(33)
Non-Vested Terminated	(660)	(29,680,238)				(660)
Rehired	18	675,001	(18)	-	-	-
Data Adjustment	-	-	-	2	1,026	2
2021	**4,715**	**$266,986,666**	**886**	**479**	**$86,329**	**6,084**

Data Adjustments

Active records are reported in the access data file in the table titled GC_Benefits_Hybrid. Information from the Legacy active file (service) is appended to this file.

Inactive vested records are reported in an excel file titled GC_Benefits_Vested_Hybrid. This was combined with a separate file called “GCHybrid_Retired_LegacyOnly.xlsx” which contained information for members that had retired under Component II (Legacy) and deferred their Component I (Hybrid) benefit.

In cases where the benefit is identified to be a joint and survivor benefit and a beneficiary is not listed in the data, it was assumed that male spouses were 3 years older than females. Benefits for dependent children are assumed to cease at age 21.

We have included liabilities for 108 members that were reported as Component II (Legacy) duty disabilities. These members were less than age 62 and did not have a corresponding Component I (Hybrid) record. They have all either not converted in Legacy or converted to legacy after June 30, 2018. The benefit for these members was estimated by using information on the Component II (Legacy) record combined with estimated service from June 30, 2014 to age 62.

Please see our 2021 data summary letter dated December 17, 2021 for additional details.

There were 33 active vested terminations that were not reported on the Terminated Vested file. We have assumed these members refunded and forfeited their defined benefit.

There were 81 Terminated Vested members that were valued last year but will not be valued this year. We have assumed these members refunded and forfeited their defined benefit.

The data adjustments relate to records where we could not specifically identify the activity during the year. This could be the result of duplicate Social Security numbers or corrected Social Security numbers.

There were several individuals that were reported in the Component I active data and appeared to be eligible in Component II, but were not reported in the Component II active data. We did not make any adjustments for these individuals.

The rationale for our data adjustments/assumptions are 1) instructions and/or information we received from staff during the data processing and 2) professional judgement.

Summary of Member Data
June 30, 2021

Active Members

	General	D.O.T.	DWSD	Library	Totals
Number	3,333	669	492	221	4,715
% Change in active members from prior year	(5.3)%	(16.9)%	(8.7)%	(9.4)%	(7.7)%
Annual payroll ($ millions)	$ 197.6	$ 29.7	$ 28.5	$ 11.1	$ 267.0
Average pay	$59,283	$44,459	$58,014	$50,280	$ 56,625
% Change in average pay from prior year	5.5 %	12.6 %	4.7 %	1.5 %	6.5 %
Average age	47.2	50.6	49.5	54.2	48.3
Average eligibility service	10.1	13.5	13.4	19.8	11.4

Retired Members

	General	D.O.T.	DWSD	Library	Totals
Number	200	81	156	42	479
Annual benefits including annuities as reported	$576,864	$183,436	$217,471	$100,900	$1,078,671
Average benefits as reported	$ 2,884	$ 2,265	$ 1,394	$ 2,402	$ 2,252
% Change in average benefit	1.0 %	15.7 %	25.1 %	20.6 %	9.5 %

*Inactive Members**

	General	D.O.T.	DWSD	Library	Totals
Number	334	144	383	25	886
Average FAC	$ 37,473	$ 38,201	$ 43,977	$39,473	$ 40,460
Average service	2.5	3.1	1.6	2.8	2.2
Annual benefits (estimated)	$592,832	$301,743	$431,996	$43,391	$1,369,963
Average benefits (estimated)	$ 1,775	$ 2,095	$ 1,128	$ 1,736	$ 1,546
% Change in average service	21.2 %	24.1 %	14.6 %	20.1 %	20.3 %
% Change in average FAC	(11.7)%	(2.3)%	(7.9)%	(16.6)%	(9.0)%

*Legacy Disabled Members**

	General	D.O.T.	DWSD	Library	Totals
Number	55	19	34	0	108
Annual benefits (estimated)	$413,739	$126,651	$276,190	$0	$816,580
Average benefits (estimated)	$ 7,523	$ 6,666	$ 8,123	N/A	$ 7,561

** Benefits unavailable. Benefits were estimated using AFC and service.*

Active Members as of June 30, 2021
by Attained Age and Years of Service
Retirement System Totals

	Years of Service to Valuation Date							Totals	
Attained Age	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
Under 20	3							3	$ 73,426
20-24	96	0						96	3,651,299
25-29	264	12	0					276	12,938,092
30-34	392	66	10	0				468	25,492,880
35-39	265	59	28	10	4			366	22,173,750
40-44	241	72	45	55	38	2		453	24,637,691
45-49	267	97	42	67	97	24	0	594	33,825,079
50-54	264	77	51	111	165	84	36	788	45,744,786
55-59	191	77	42	75	180	100	119	784	45,353,629
60-64	137	59	38	61	90	80	148	613	35,217,810
65-69	51	33	19	10	30	13	43	199	13,128,941
70-74	14	8	6	8	11	3	6	56	3,521,147
75-79	1	5	2	2	3	1	5	19	1,228,136
Totals	**2,186**	**565**	**283**	**399**	**618**	**307**	**357**	**4,715**	**$266,986,666**

Group Averages:

Age:	48.3 years
Benefit Service:	4.3 years
Eligibility Service:	11.4 years
Annual Pay:	$56,625

Historical Summary of Active Member Data

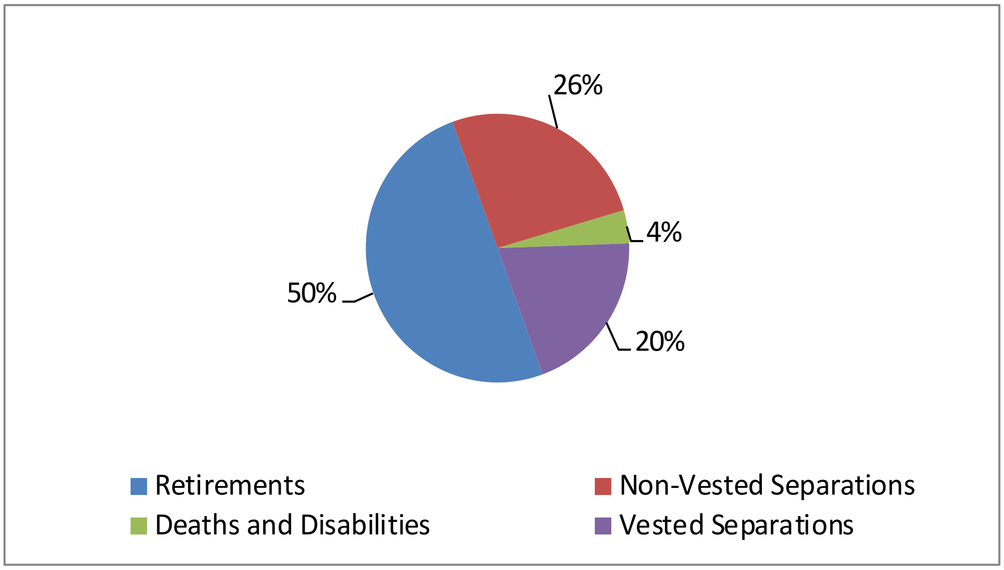
Valuation	Active Members		Covered Payroll		Average Salary		Average		
Date	No.	% Increase	$ Amount	% Increase	$ Amount	% Increase	Age	Service	Entry Age
2014#	4,881	N/A	$ 203,507,079	N/A	$ 41,694	N/A	49.2	16.0	33.2
2015	4,981	2.0%	199,135,119	(2.1)%	39,979	(4.1)%	48.6	15.3	33.3
2016	4,235	(15.0)%	169,014,411	(15.1)%	39,909	(0.2)%	47.7	13.1	34.6
2017	5,117	20.8%	229,954,351	36.1%	44,939	12.6%	46.4	11.3	35.1
2018	5,629	10.0%	263,291,986	14.5%	46,774	4.1%	45.9	10.6	35.3
2019	5,794	2.9%	280,105,756	6.4%	48,344	3.4%	45.9	10.3	35.6
2020	5,106	(11.9)%	271,410,800	(3.1)%	53,155	10.0%	47.5	11.1	36.4
2021	4,715	(7.7)%	266,986,666	(1.6)%	56,625	6.5%	48.3	11.4	36.9

\# *Payroll shown for 2014 is based on payroll reported for Component II (Legacy Plan). Covered Payroll information under Component I payroll definitions was not available. 2014 Valuation results were adjusted to estimate the difference between the Component I and Component II Covered Pay.*

Summary of Membership Data by Category

	June 30, 2021	June 30, 2020
Active Members		
Number	4,715	5,106
Average age (years)	48.3	47.5
Average service (years)	11.4	11.1
Average salary	$56,625	$53,155
Total payroll supplied, annualized	$266,986,666	$271,410,800
Vested Inactive Members		
Number	886	880
Average age (years)	56.7	55.9
Total calculated deferred benefits ($ millions)	$1.4	$1.1
Average annual deferred benefit (estimated)	$1,546	$1,283
Service Retirees		
Number	471	381
Average age (years)	66.9	66.4
Total annual benefits ($ millions) (excluding annuities)	$1.0	$0.8
Average annual benefit (estimated) (excluding annuities)	$2,149	$2,031
Disability Retirees		
Number	1	0
Average age (years)	63.4	N/A
Total annual benefits ($ millions) (excluding annuities)	$0.0	N/A
Average annual benefit (estimated) (excluding annuities)	$3,762	N/A
Beneficiaries (Including death-in-service)		
Number	7	8
Average age (years)	67.0	64.5
Total annual benefits ($ millions) (excluding annuities)	$0.0	$0.0
Average annual benefit (estimated) (excluding annuities)	$2,834	$222
Legacy Disability Retirees		
Number	108	119
Average age (years)	56.1	55.8
Total annual benefits ($ millions) (estimated)	$0.8	$0.9
Average annual benefit (estimated)	$7,561	$7,205

Expected Terminations from Active Employment for Current Active Members



The chart above shows the expected future development of the present population in simplified terms. The Retirement System presently covers 4,715 active members. Eventually, 1,229 people are expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. 3,279 people are expected to receive monthly retirement benefits either by retiring directly from active service, or by retiring from vested deferred status. 207 people are expected to incur death-in-service or disability benefits. Vested Separations may include members eligible to retire in the Component II (Legacy) plan but not yet eligible to retire in this Component I (Hybrid) plan. A detailed discussion on how members eligible to retire in Component II (Legacy) but not eligible to retire in Component I (Hybrid) are treated is included in Section F of this report.

SECTION F

METHODS AND ASSUMPTIONS

Summary of Assumptions and Methods Used for Actuarial Valuations Adopted by Board of Trustees

Funding Methods

The entry age actuarial cost method was used in determining liabilities and normal cost as prescribed by Section 9.3(1) of the Combined GRS Plan. Under this method, each individual's normal cost is determined as a level percent of pay based on a replacement life normal cost. Normal cost for each member is based on the Component I benefits and eligibilities applicable to that member and is determined to be the level percent of payroll from hire date to the age of last decrement necessary to fund the benefits. This method is based on the objective of the plan to separately fund Transition Cost and future accruals. The application of this method differs for funding and accounting.

Unfunded Actuarial Accrued Liabilities - Actual employer contributions through June 30, 2023 are set at 5.0% of pay. Additional funding for Transition Costs may occur as a result of Component II ASF transfers. Employer contributions after June 30, 2023 will be actuarially determined based on the Board's funding policy. The Board funding policy has not yet been established.

Present assets are set equal to the Market Value.

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

Summary of Assumptions and Methods Used for Actuarial Valuations Adopted by Board of Trustees

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

Economic Assumptions

Actuarial Assumptions
The assumptions and methods are those adopted by the Board with the exception of the discount rate. For purposes of plan funding, the discount rate is 6.75% as prescribed by Section 1.16(3) of the Combined GRS Plan.

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

Pay increase assumptions for individual active members are shown on page 34. Part of the assumption for each age is for a merit and/or seniority increase, and the other recognizes wage inflation. **Wage inflation** is assumed to be 3.0% per year. The rationale is based on the 2015-2020 Experience Study.

Price inflation is not directly used in the valuation. For purposes of assessing the reasonableness of the assumed rate of return, we assumed a price inflation of 2.50% per year. The rationale is based on the 2015-2020 Experience Study.

Administrative expenses are assumed to be 0.59% of payroll. The rationale is based on the 2015-2020 Experience Study.

Non-Economic Assumptions

The mortality table used to measure healthy retiree mortality was the PubG-2010(B) Below-Median General mortality tables decreased by 3% for males and increased 26% for females for healthy retirees. For disabled retiree mortality PubNS-2010 Non-Safety Disabled Retiree table increased by 4% for males and decreased 2% for females was used for disabled retiree. Pre-retirement mortality is based on the PubG-2010(B) Below-Median General Employee mortality table with no adjustments. 25% of the pre-retirement mortality was assumed to be duty related. The tables are projected to be fully generational, based on the 2-dimensional, sex distinct mortality improvement scale MP-2021 (which was intended to be used with Pub-2010). The rationale is based on the 2015-2020 Experience Study.

The probabilities of retirement for members eligible to retire are shown on pages 35 and 36. The rationale is based on the 2015-2020 Experience Study.

The probabilities of separation from service (excluding *death-in-service* and including *disability*) are shown for sample ages on page 37. The rationale is based on the 2015-2020 Experience Study.

Sample Salary Adjustment Rates

Sample Ages	Salary Increase Assumptions For an Individual Member: Merit & Seniority	Wage (Economic)	Increase Next Year
20	4.9%	3.0%	7.9%
25	4.9%	3.0%	7.9%
30	4.1%	3.0%	7.1%
35	3.0%	3.0%	6.0%
40	2.3%	3.0%	5.3%
45	1.8%	3.0%	4.8%
50	1.0%	3.0%	4.0%
55	0.2%	3.0%	3.2%
60	0.0%	3.0%	3.0%
Ref	572		

The rationale is based on the 2015-2020 Experience Study.

Single Life Retirement Values

Based on PubG-2010(B) Below-Median General
97% of Male Rates / 126% of Female Rates
Using Projection Scale MP-2021

Sample Attained Ages in 2021	Future Life Expectancy (years): Men	Women
45	37.47	39.95
50	32.54	34.89
55	28.16	30.31
60	23.94	25.80
65	19.86	21.37
70	15.90	17.05
75	12.26	13.04
80	9.07	9.51

Probabilities of Age/Service Retirement

Retirement	Percent of Eligible Active Members Retiring Within Next Year with Unreduced Benefits		
Ages	E.M.S.	D.O.T.	Others
62	40%	20%	20%
63	40%	20%	20%
64	40%	20%	20%
65	40%	20%	20%
66	40%	20%	20%
67	40%	30%	20%
68	40%	30%	20%
69	40%	30%	20%
70	100%	100%	20%
71	100%	100%	20%
72	100%	100%	20%
73	100%	100%	20%
74	100%	100%	20%
75	100%	100%	20%
76	100%	100%	20%
77	100%	100%	20%
78	100%	100%	20%
79	100%	100%	20%
80	100%	100%	100%
Ref	2160	3304	3305

All members are assumed to retire while eligible for Component I (Hybrid) retirement only.

The rationale is based on the 2015-2020 Experience Study.

Probabilities of Early Retirement for Members Eligible for Early Retirement

Retirement Ages	Percent of Eligible Active Members Retiring Within Next Year with Reduced Benefits
55	6.5%
56	6.5%
57	6.5%
58	7.5%
59	8.5%
60	9.5%
61	9.5%
62	9.5%
Ref	3303

All members are assumed to retire while eligible for Component I (Hybrid) retirement only.

The rationale is based on the 2015-2020 Experience Study.

Sample Rates of Separation from Active Employment Before Retirement

Sample Ages	Years of Service	% of Active Members Separating Within Next Year — Withdrawal: E.M.S.	D.O.T.	Others: Men	Women
ALL	0	16.00%	28.00%	28.00%	28.00%
	1	15.00%	19.00%	19.00%	19.00%
	2	15.00%	15.00%	15.00%	15.00%
	3	11.00%	14.00%	14.00%	14.00%
	4	11.00%	14.00%	14.00%	14.00%
25	5 & Over	10.05%	13.00%	13.00%	13.00%
30		8.85%	11.91%	11.91%	11.91%
35		7.80%	9.25%	9.25%	9.25%
40		6.60%	7.19%	7.19%	7.19%
45		5.10%	5.91%	5.91%	5.91%
50		3.60%	5.00%	5.00%	5.00%
55		3.00%	5.00%	5.00%	5.00%
60		3.00%	5.00%	5.00%	5.00%
Ref		1405	1406	1406	1406
		1608	1609	1609 x 1	1609 x 1

Sample Ages	% of Active Members Becoming Disabled Within Next Year — D.O.T.: Ordinary	D.O.T.: Duty	Others: Ordinary	Others: Duty
25	0.16%	0.24%	0.03%	0.03%
30	0.19%	0.28%	0.04%	0.04%
35	0.26%	0.39%	0.05%	0.05%
40	0.37%	0.56%	0.08%	0.08%
45	0.56%	0.84%	0.12%	0.12%
50	0.70%	1.05%	0.15%	0.15%
55	0.82%	1.23%	0.17%	0.17%
60	0.94%	1.41%	0.20%	0.20%
Ref	1238 x 1.20	1238 x 1.80	1238 x 0.25	1238 x 0.25

The rationale is based on the 2015-2020 Experience Study.

Miscellaneous and Technical Assumptions

Benefit Service	Exact fractional service is used to determine the amount of benefit payable.
Decrement Operation	Disability and mortality decrements do not operate during the first 5 years of service. Disability and withdrawal also do not operate during retirement eligibility.
Decrement Timing	Decrements of all types are assumed to occur mid-year.
Eligibility Testing	Eligibility for benefits is determined based upon the age nearest birthday and rounded service on the date the decrement is assumed to occur.
Forfeitures	None.
Marriage Assumption	100% of males and 100% of females are assumed to be married for purposes of death-in-service benefits. Male spouses are assumed to be three years older than female spouses for active member valuation purposes.
Normal Form of Benefit	Straight life is the normal form of benefit.
Service Credit Accruals	Service accruals for calculating benefits begin as of June 30, 2014 for Component I liabilities. However, service in Component II may be used to satisfy benefit eligibility requirements in Component I.
Sick Leave	None.
Pay Increase Timing	End of (Fiscal) year. This is equivalent to assuming that reported pays represent amounts to be paid to members during the year starting on the valuation date.
Disability Benefits	Duty Disability benefits were increased by 27% to account for the Death While Disabled provision.
Workers Compensation	Workers compensation for duty death-in-service benefits was assumed to equally offset the 10% AFC minimum benefit.
Actuarial Equivalent	No adjustments have been made for Actuarial Equivalent benefits. The Board adopted assumptions for Actuarial Equivalence to be an 80%/20% unisex blend of RP-2014 mortality (Male/Female) with Blue Collar Adjustment, set ahead 1 year for males and females, projected 11 years with MP-2014, an interest rate of 6.75, and a 0.5% simple COLA starting the later of 1 year after retirement or age 62 for optional forms of payment and early retirement reduction. Assumptions for annuitizing member contributions are the same except for using a 60%/40% unisex blend, a 5.25% assumed rated of interest, and no COLA.
IRC Section 415 Limit	No adjustments have been made for 415 limits. The limit is assumed to grow with wage inflation.
IRC Section 401(a)(17) Limit	All of the member salary provided falls below the 401(a)(17) limit. The limit is assumed to grow with wage inflation.
IRC Section 401(h) Limit	We did not test for the 401(h) limit on employer contributions for medical benefits. No employer contributions are anticipated in this valuation.

Miscellaneous and Technical Assumptions (Concluded)

COLA (VPIF)	The valuation assumption is that on average future COLA's will be 0.5%. Unless otherwise stated, all costs shown in this report are based on a 0.5% VPIF. Transition Costs are based on a 0.0% VPIF.
Voluntary Contributions	For the valuation, future voluntary contributions will be reflected in future valuations as they occur. With exception of the Section 9.5 projection, no adjustments have been made to reflect future interest crediting to voluntary contributions. For fiscal responsibility calculation, see Section C for assumptions.
New Entrant Assumption	New entrants are assumed to replace the current workforce as members separate from service under current valuation assumptions. Total payroll is expected to grow with wage inflation.
Pop-Up Benefits	For current retirees with a pop-up benefit, the value of the pop-up was estimated by valuing a non-pop-up option and increasing the associated liabilities by 2%.
Incidence of Contributions	Employer contributions are assumed to occur quarterly.

SECTION G

PLAN PROVISION SUMMARY (AS APPROVED BY STAFF)

City of Detroit General Retirement System
Summary of Component I Benefit Provisions Evaluated

Plan Year

The Plan Year is the 12-month period commencing on July 1, and ending on June 30. The first plan year starts July 1, 2014.

Full Time Employees

Full Time Employees are individuals who are required to work 600 hours per year. Part time transit operators working 25 hours per week are not full time employees. Special Service Operators are required to work 1,440 hours per year. However, once a Special Service Operator meets the requirement in any year, he or she is deemed to meet it in all future years.

Plan Membership

The membership of the Retirement System shall consist of all persons who are Full Time Employees of the City of Detroit except persons who are members of the Police and Fire Retirement System of the City of Detroit and those individuals who are active members in any other public employee pension plan adopted by either the State of Michigan (other than the Michigan National Guard), or any other political subdivision of the State of Michigan.

Service Credit

Credited Service: A member is credited with one month of Credited Service for each calendar month in which the individual performs 140 hours or more of service for the employer as an employee. Credited Service is recorded from the later of July 1, 2014, or the date of hire whichever is later.

Prior Service: Refers to service credit awarded to a member prior to July 1, 2014 under the terms of the Retirement System in effect on June 30, 2014.

Vesting Service: A member is credited with a year of vesting service for each Plan Year commencing on or after July 1, 2014 during which the member performs 1,000 or more hours of work for the employer. Prior Service, as defined above, is also Vesting Service.

Military Service: A member who enters the military while employed by the City and returns to employment with the City following military service receives service credit in the Retirement System for the military service time as though there had been no interruption of employment. In order to receive such service credit, the individual must pay contributions to the Retirement System for the military service time upon return to employment.

City of Detroit General Retirement System
Summary of Component I Benefit Provisions Evaluated

Average Final Compensation

Compensation: Compensation is base salary or wages, excluding bonuses, overtime pay, payment of unused accrued sick leave, longevity pay, payment for unused accrued vacation, the cost or value of fringe benefits, termination or severance pay, reimbursement of expenses or other extra payment of any kind. Compensation includes deferred compensation and “picked up” employee contributions to the Retirement System. Compensation is limited by IRC Section 401(a)(17).

Average Final Compensation: The average of the compensation received during the 10 consecutive years of Credited Service (including Prior Service) immediately preceding the date of the members last termination with the employer. If the member has less than ten years of Credited Service (including Prior Service), the Average Final Compensation is the average of the compensation received during all years of Credited Service.

Normal Retirement

Normal Retirement Age: The Normal Retirement Age is 62. For individuals who were active employees and who had 10 or more years of Vesting Service as of June 30, 2014 the normal retirement age is reduced as follows.

Age as of July 1, 2014	Normal Retirement Age
52 years or younger	62 Years
53 years	61 years and 9 months
54 years	61 years and 6 months
55 years	61 years and 3 months
56 years	61 years
57 years	60 years and 9 months
58 years	60 years and 6 months
59 years	60 years and 3 months
60 years	60 years
61 years	60 years

Normal Retirement Date: The later of 10 years of Vesting Service and attainment of Normal Retirement Age.

Normal Retirement Amount: The retirement allowance payable to a member who retires on or after the normal retirement date is 1.5% times Average Final Compensation times Credited Service (after June 30, 2014) measured to the nearest month.

Early Retirement

Eligibility: Age 55 with 30 or more years of credited service plus prior service.

Early Retirement Amount: The early retirement amount is the Actuarial Equivalent of the deferred retirement allowance that would be payable to the member on the Normal Retirement Date, assuming that the member terminated employment on the early retirement date.

Deferred Retirement (Vested Benefit)

Eligibility: 10 years of Vesting Service.

Benefit Commencement: *A*ge 62.

Annual Amount: Same as Normal Retirement but based on Average Final Compensation and Credited Service at the time of termination.

Disability Retirement

Eligibility: The individual must be eligible for long term disability benefits under a policy or plan of insurance or self-insurance maintained by the employer.

Amount: The Normal Retirement Allowance payable at Age 62. For members disabled in the line of duty, credited service accrues while a member is entitled to receive long term disability under the employer's plan or policy.

Accidental (Line of Duty) Death Before Retirement

Eligibility: Death resulting directly from performance of duty in the service of the employer or as a result of illness contracted or injuries received while in the service of the employer.

Amount: The surviving spouse is eligible to receive a monthly amount equal to the member's Retirement Allowance at time of death (minimum 10% of Average Final Compensation), unreduced for early payment, and payable until the surviving Spouse's death. Amounts payable from Worker's Comp or similar programs are offset against the amount payable to the spouse.

Ordinary (Other than Line of Duty) Death Before Retirement

Eligibility: 10 or more years of credited service (or death during disability, but prior to commencement of the retirement allowance). The individual must be employed by the employer at time of death.

Amount: The Surviving Spouse shall receive a retirement allowance computed as though the member had retired the day before death, notwithstanding that the death was prior to the normal retirement date, elected the Joint and 100% Option in favor of the spouse, and then died. Amounts payable from Worker's Comp or similar programs are offset against the amount payable to the spouse.

City of Detroit General Retirement System
Summary of Component I Benefit Provisions Evaluated

Refund of Mandatory Contributions

A member who ceases to be an employee for reasons other than death, or disability, may elect to receive a refund of mandatory Accumulated Contributions (without interest) in lieu of any other Component I benefit payable. In the case of a member who dies while employed by the City, or following termination of employment with the City, if no Surviving Spouse benefit is payable, the accumulated mandatory Employee Contributions (without interest) are paid to the member's estate.

Variable Pension Improvement Factor (VPIF Escalator)

Eligibility: Attainment of at least Age 62, and in receipt of a retirement allowance for at least 12 months as of the first day of the Plan Year.

Amount: Beginning July 1, 2018 and effective the first date of each Plan year thereafter, the Board may determine that a retiree's Component I Retirement Allowance shall be increased by 2% of the original retirement allowance. The VPIF Escalator may not be awarded in the event that the funding level of Component I of the Retirement System projected over a 5-year period falls below 100%. The VPIF escalator is not compounded.

Contributions

Members: 4% of Compensation. Member contributions are "picked up" in accordance with IRC 414(h).

Employers: 5% of Compensation commencing July 1, 2014 and ending June 30, 2023, to be split between the Pension Accumulation Fund and the Rate Stabilization reserve. For Plan years beginning July 1, 2023 and later, contributions shall be determined by an Actuary using reasonable and appropriate assumptions approved by the Board and the Investment Committee.

Voluntary Employee Contributions

Eligibility: Non-union member, or union member with Coverage by a collective bargaining agreement that permits the member to make Voluntary Employee Contributions to Component I.

Amount: 3%, 5%, or 7% of compensation at the election of the member. All voluntary employee contributions are made on an after tax basis.

Earnings Crediting: Each Plan Year, accounts are credited with earnings at a rate equal to the net investment rate of return of Retirement System Assets for the second Plan Year immediately preceding the Plan Year in which earnings are to be credited. The earnings rate may not be less than 0% and may not exceed 5.25%.

Distribution: Upon termination of employment, accounts may be distributed in a lump sum, in equal monthly installments for a period not exceeding three years, or, at the option of the member, in the form of an actuarially equivalent life annuity payable in the same form as and added to the member's Retirement Allowance. The determination of actuarial equivalent for this purpose is based upon market rates of investment return and other market related assumptions. In the case of a member who dies before receiving a distribution of his or her voluntary account, the value of the account is payable to the nominated beneficiary, or to the estate.

Forms of Payment

Normal Form of Payment: The normal form of payment is a straight life allowance with no death benefit, and, in particular, no residual refund of mandatory employee contributions. Until the date the first Retirement Allowance payment check is issued, any Member may elect to receive payment either in the Normal Form or in the Actuarial Equivalent of the Normal Form computed as of the effective date of retirement and payable in one of the forms described below.

Option One. Modified Cash Refund Annuity: If a Retiree who elected a Modified Cash Refund Annuity dies before payment has been received in an aggregate amount equal to, but not exceeding the Retiree's Accumulated Mandatory Employee Contributions at the time of retirement, the difference between said Accumulated Mandatory Employee Contributions and the aggregate amount of annuity payments already received, shall be paid in a single lump sum to a Beneficiary nominated by written designation duly executed by the Member and filed with the Board. If there are no such designated Beneficiaries surviving said Retiree, any such difference shall be paid to the Retiree's estate.

Option Two. Joint and One Hundred Percent Survivor Allowance: Upon the death of a Retiree who elected a Joint and One Hundred Percent Survivor Allowance, one hundred percent of the reduced Retirement Allowance shall be paid to and continued throughout the life of the Beneficiary nominated by written designation duly executed and filed with the Board prior to the date the first payment of the Retirement Allowance becomes due.

Option "A". Joint and Seventy-Five Percent Survivor Allowance: Upon the death of a Retiree who elected a Joint and Seventy-Five Percent Survivor Allowance, seventy-five percent of the reduced Retirement Allowance shall be continued throughout the life of and paid to the Beneficiary nominated by written designation duly executed by the Member and filed with the Board prior to the date the first payment of the Retirement Allowance becomes due.

Option Three. Joint and Fifty Percent Survivor Allowance: Upon the death of a Retiree who elected a Joint and Fifty Percent Survivor Allowance, fifty percent of the reduced Retirement Allowance shall be continued throughout the life of and paid to the Beneficiary nominated by written designation duly executed by the Member and filed with the Board prior to the date the first payment of the Retirement Allowance becomes due.

Option "B". Joint and Twenty-Five Percent Survivor Allowance: Upon the death of a Retiree who elected a Joint and Twenty-Five Percent Survivor Allowance, twenty-five percent of the reduced Retirement Allowance shall be paid throughout the life of the Beneficiary nominated by written designation duly executed and filed with the Board prior to the date the first payment of the Retirement Allowance becomes due.

Joint and Survivor Optional Forms of Payment: The Joint and Survivor Optional Forms of Payment provided under the Retirement System shall be made available in either the standard form or the pop-up form, as follows:

> ***Standard Form:*** Under the Standard Form, the reduced Retirement Allowance shall be paid throughout the lifetime of the Retiree.

Pop-up Form: Under the Pop-up Form, the reduced Retirement Allowance shall be paid throughout the lifetime of the Retiree and the designated Beneficiary. In the event of the death of the designated Beneficiary during the lifetime of the Retiree, the amount of the Retirement Allowance shall be changed to the amount that would have been payable had the Retiree elected the Straight Life Retirement Allowance Form of Payment.

Coordination of Benefits: According to such rules and regulations as the Board shall adopt, until the first payment of a Retirement Allowance becomes due, but not thereafter, a Member under age sixty-five may elect to have the Member's Straight Life Retirement Allowance provided for under Component I equated on an Actuarial Equivalent basis to provide an increased Retirement Allowance payable to age sixty-two or age sixty-five, and to provide a decreased Retirement Allowance thereafter. The increased Retirement Allowance payable to such age shall approximate the total of the decreased Retirement Allowance payable thereafter and the estimated social security benefit. If a Member elects to receive increased and then decreased Retirement Allowance payments provided for in this paragraph, he or she may also elect to have such payments reduced by electing one of the optional forms of payment described above.

Disposition of Residue: If under a Joint and One Hundred Percent Survivor allowance, a Joint and Seventy-Five Percent Survivor allowance, a Joint and Fifty Percent Survivor allowance, or a Joint and Twenty-Five Percent Survivor allowance as provided above, both the Retiree and the Beneficiary die before they have received, in Retirement Allowance payments, an aggregate amount equal to the Retiree's Accumulated Mandatory Employee Contributions at the time of retirement, the difference between the said Accumulated Mandatory Employee Contributions and the aggregate amount of Retirement Allowances paid to the Retiree and Beneficiary, shall be paid in a single lump sum to such person or persons nominated by written designation of the Retiree duly executed and filed with the Board. If there are no such person or persons surviving the Retiree and the Beneficiary, any such difference shall be paid to the estate of the second to die of the Retiree or Beneficiary.

Rehire Before or After Retirement

A non-vested former member who is reemployed (except as a part time transit operator) within 6 years of termination may repay mandatory contributions. In such case, forfeited Credited Service and Vesting service are restored. If the member is reemployed more than 6 years following separation, mandatory contributions cannot be repaid. Vesting Service and Credited Service start over beginning with the date of reemployment.

A former member who is vested but has not yet begun to receive a Retirement Allowance and who is rehired **prior to being separated for six years** shall have the benefit pertaining to total Credited Service earned on and after July 1, 2014 calculated in accordance with the terms of Component I of the Retirement System in effect at the time of the last separation from service. If the former member has previously withdrawn mandatory accumulated contributions, and such withdrawn contributions are not repaid within two years of the rehire date, only the Credited Service earned on and after the rehire date shall be taken into consideration in determining the retirement allowance.

A former member who is vested but has not begun to receive a Retirement Allowance and **who is rehired after being separated for more than six years** shall be entitled to two separate and distinct pension benefits under Component I, each to be calculated in accordance with the provisions of Component I of the Retirement System in effect at the time of each separation from service. If the former member has previously withdrawn mandatory accumulated contributions, and such withdrawn contributions are not repaid within two years of the rehire date, only the Credited Service earned on and after the rehire date shall be taken into consideration in determining the retirement allowance.

Retirement benefits for a Retiree who returns to active full time employment with an Employer shall be subject to the following provisions:

- A Retiree who returns to work will have the Retirement Allowance suspended upon re-employment. The variable pension improvement factor (escalator) shall not be added to the amount of the original Retirement Allowance during the Retiree's re-employment period.
- A Retiree who returns to work will be entitled to receive a second Retirement Allowance in accordance with the provisions of the Retirement System in effect during the re-employment period.
- A Retiree's Average Final Compensation for purposes of determining the second Retirement Allowance will be based upon the Compensation earned by the Retiree after the return to work.
- An individual who retires for a second time will not be allowed to change the payment option selected with respect to the original Retirement Allowance. However, the individual may select a separate payment option with respect to the second Retirement Allowance.
- The Coordination of Benefits (Equated Social Security) option will not be available with respect to payment of the second Retirement Allowance.

SECTION H

GLOSSARY

Glossary

Accrued Service	The service credited under the plan which was rendered before the date of the actuarial valuation.
Actuarial Accrued Liability (AAL)	The difference between the Actuarial Present Value of Future Benefits, and the Actuarial Present Value of Future Normal Costs.
Actuarial Assumptions	Assumptions about future plan experience that affect costs or liabilities, such as: mortality, withdrawal, disablement, and retirement; future increases in salary; future rates of investment earnings; future investment and administrative expenses; characteristics of members not specified in the data, such as marital status; characteristics of future members; future elections made by members; and other items.
Actuarial Cost Method	A procedure for allocating the Actuarial Present Value of Future Benefits between the Actuarial Present Value of future Normal Costs and the Actuarial Accrued Liability.
Actuarial Equivalent	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial Present Value (APV)	The amount of funds required to provide a payment or series of payments in the future. It is determined by discounting the future payments with an assumed interest rate and with the assumed probability each payment will be made.
Actuarial Present Value of Future Benefits (APVFB)	The Actuarial Present Value of amounts which are expected to be paid at various future times to active members, retired members, beneficiaries receiving benefits, and inactive, nonretired members entitled to either a refund or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial Valuation	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan. An Actuarial Valuation for a governmental retirement system typically also includes calculations of items needed for compliance with GASB No. 25, such as the Funded Ratio and the Annual Required Contribution (ARC).
Actuarial Value of Assets	The value of the assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets or a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the actuarially required contribution (ARC).

Glossary

Actuarially Determined Employer Contribution	The employer's periodic required contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the Plan's actuarial funding policy.
AFC	Average Final Compensation.
Amortization Method	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the Amortization payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the UAAL. Under the Level Percentage of Pay method, the stream of payments increases at the rate at which total covered payroll of all active members is assumed to increase.
Amortization Payment	That portion of the plan contribution or actuarially determined employer contribution which is designed to pay interest on and to amortize the Unfunded Actuarial Accrued Liability.
Amortization Period	The period used in calculating the Amortization Payment.
APTE	Association of Professional and Technical Employees.
ASF	Annuity Savings Fund of the Component II (Legacy) Plan.
Closed Amortization Period	A specific number of years that is reduced by one each year, and declines to zero with the passage of time. For example, if the amortization period is initially set at 30 years, it is 29 years at the end of one year, 28 years at the end of two years, etc.
COLA	Cost-of-Living Adjustment. Analogous to a VPIF (see VPIF on page 50).
Contribution Budgeting Liability	An expected return-based measure of pension obligation.
D.O.T.	Department of Transportation.
Employer Normal Cost	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
E.M.S.	Emergency Medical Service.

Glossary

Equivalent Single Amortization Period	For plans that do not establish separate amortization bases (separate components of the UAAL), this is the same as the Amortization Period. For plans that do establish separate amortization bases, this is the period over which the UAAL would be amortized if all amortization bases were combined upon the current UAAL 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 valuations. To the extent that actual experience differs from that assumed, Unfunded Actuarial Accrued Liabilities emerge which may be larger or smaller than projected. Gains are due to favorable experience, e.g., the assets earn more than projected, salaries do not increase as fast as assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, losses are the result of unfavorable experience, i.e., actual results that produce Unfunded Actuarial Accrued Liabilities which are larger than projected.
Funded Ratio	The ratio of the Actuarial Value of Assets to the Actuarial Accrued Liability.
GASB	Governmental Accounting Standards Board.
GASB No. 67 and GASB No. 68	These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67 sets the rules for the systems themselves.
GLWA	Great Lakes Water Authority.
Normal Cost	The annual cost assigned, under the Actuarial Cost Method, to the current plan year.
Open Amortization Period	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. In other words, if the initial period is set as 30 years, the same 30-year period is used in determining the Amortization Period each year. In theory, if an Open Amortization Period is used to amortize the Unfunded Actuarial Accrued Liability, the UAAL will never completely disappear, but will become smaller each year, either as a dollar amount or in relation to covered payroll.
POA	The 8th Amended Plan for the Adjustment of the Debt of the City of Detroit.
POC	Pension Obligation Certificates.

Glossary

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.
RSF	Rate Stabilization Fund.
SAAA	Senior Accountants, Analysts, and Appraisers Association.
Solvency Liability	A market-based measure of the present value of accrued benefits at a municipal bond discount rate unadjusted for the credit quality of the plan sponsor.
Transition Cost	Initial unfunded liability as described in Section E-16 of the Plan Document.
Unfunded Actuarial Accrued Liability	The difference between the Actuarial Accrued Liability and Actuarial Value of Assets.
Valuation Date	The date as of which the Actuarial Present Value of Future Benefits are determined. The benefits expected to be paid in the future are discounted to this date.
VPIF	Variable Pension Improvement Factor. Discussed in Section 6.2 of the Plan Document. This is analogous to a post-retirement Cost-of-Living Adjustment (COLA).